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Department of
Agriculture

Full Announcement

Small Business Innovation Research Program – Phase I Fiscal Year 2012

National Institute of
Food and Agriculture

Competitive Programs

SBIR-12-1

Phase I Closing Date: September 1, 2011

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Acronym List

ADO – Authorized Departmental Officer
APHIS – Animal and Plant Health Inspection Service
AR – Authorized Representative
ASAP – Automated Standard Applications for Payment System

CCR – Central Contractor Registry
CFDA – Catalog of Federal Domestic Assistance
CFR – Code of Federal Regulations
COI – Conflict of Interest
CRADA – Cooperative Research and Development Agreement

DHHS – Department of Health and Human Services
DUNS – Data Universal Number System

E-Business POC - E-Business Point of Contact

F&A – Facilities and Administration
FR – Federal Register
FY – Fiscal Year

HUBZONE – Historically Underutilized Business Zone

M-PIN – Marketing Partner Identification Number

NIFA – National Institute of Food and Agriculture
NPL – National Program Leader

PD – Project Director
PDF – Portable Document Format
PI – Principle Investigator
POC – Point of Contact
PRS – Peer Review System

R/R&D – Research or Research and Development
R&D – Research and Development
R&R – Research and Related

SBA – Small Business Administration
SBC – Small Business Concern
SBIR – Small Business Innovation Research Program
STTR – Small Business Technology Transfer Program

U.S. – United States
USDA – United States Department of Agriculture

******* PLEASE READ *******

IMPORTANT CHANGES IN THE USDA SBIR Fiscal Year (FY) 2012 PROGRAM SOLICITATION

Proposed research must be responsive to one of the USDA program interests as stated in the research topic area descriptions of this solicitation, see section 8.0. The USDA does not prioritize between research topic areas. Applicants are encouraged to submit applications that focus on the research topic areas identified in this Full Announcement. Applicants should pay attention to specific instructions located within each of the topic areas, section 8.0, when developing their applications.

THE USDA SBIR PROGRAM REQUIRES ALL FY 2012 APPLICATIONS BE SUBMITTED ELECTRONICALLY THROUGH GRANTS.GOV. THIS SBIR PROGRAM FUNDING OPPORTUNITY IS FOR PHASE I APPLICATIONS AND HAS A CLOSING DATE OF SEPTEMBER 1, 2011.

PLEASE NOTE:

The following is a list of items that will exclude an application from review. It is the responsibility of the applicant to ensure that the directions in this Full Announcement are followed.

- **Complete, error-free applications must be submitted via Grants.gov by 5:00 p.m. Eastern Time, on the Phase I deadline of September 1, 2011, as indicated under section 6.1 of this full announcement. Applications submitted after this deadline will result in the application being excluded from review.**
- **All attachments MUST be submitted in the Portable Document Format (PDF). Applications that are received and are missing required PDF attachments are not eligible to be considered for a Phase I SBIR award and will not be reviewed.**
- **Applicants must not password protect any PDF attachment. It is the responsibility of the applicant to correctly submit the attachments in the correct format. Grants.gov will not check the application for adherence to this requirement at the time of submission.**
- **Applicants must register with Grants.gov in a timely manner to meet the published deadline of this full announcement. The registration procedure for applicants intending to submit a grant application through Grants.gov requires several steps and must be finished prior to submitting an application. Grants.gov requires all applicants to update their registration on an annual basis; therefore it is the responsibility of the applicant to ensure their registration is updated and correct at the time of submission. The registration process can take several weeks to complete, so it is critical that companies begin the registration process as soon as a decision to submit an application to this program is determined. Failure by an applicant to register or verify their registration with Grants.gov in time for the submission will result in the application being excluded from review.**
- **Applicants must allow additional time for electronic submission and plan ahead to allow time for correction of technical errors identified by Grants.gov in the submission process. It is recommended that applicants begin submitting their completed application at least one to two days prior to the deadline. USDA SBIR will not accept late applications. Exceptions are made only for delays due to natural disasters or technical problems experienced by**

Grants.gov. Documentation of the problem will be required from the Applicant. Exceptions made for technical problems with the Grants.gov system must be supported by documentation that a reasonable effort was made to overcome Grants.gov system failures prior to the deadline.

Applicants who have problems with their submissions to Grants.gov should call the Grants.gov help desk (1-800-518-4726) immediately to help resolve the problem and keep a record of any correspondence and case numbers with Grants.gov regarding the submission problem. Applicants who have problems with their submissions to Grants.gov must keep a record of the following:

1. Grants.gov Tracking Numbers
2. Case numbers provided by Grants.gov
3. Any correspondence with Grants.gov regarding the submission problem
4. Any correspondence with CCR and Dunn and Bradstreet during the registration process

Once the application is successfully submitted to Grants.gov the applicant must forward the case number and correspondence via email to sbir@nifa.usda.gov. Information obtained from the case number and correspondence will be used to verify if the submission problem was due to a Grants.gov system failure or due to a problem with the applicant. This information will be used to determine the final decision to accept or not accept a late application.

- Applications that do not address in their narrative the criteria listed in Section 3.3.3 R&R Other Project Information – Field 8 will be excluded from review.
- Applicants must ensure that the abstract and project narrative attachments meet the required page limits regardless of whether the document is single or double spaced. Applications that exceed required page limits will be excluded from review.
- Applicants must request a federal budget that is reasonable and must not exceed a ceiling of \$100,000.00 for 8 months. If an applicant requests a fee, the combined total of “Section I - Total Direct and Indirect Costs” and “Section J – Fee” on the Research & Related (R&R) Budget form must not exceed the ceiling of this full announcement. Budget requests that exceed the ceiling of this full announcement will be excluded from review.
- Applicants must ensure that the budget provided in the R&R Budget forms matches the requested budget amount found in field 15 (a) on the SF-424 form and that this number does not exceed the budget ceiling. Applications with a budget request over the ceiling on either of these forms will be excluded from review.
- Please note, individual proprietorships, i.e., farmers, ranchers, etc., must register with Grants.gov as organizations, not as individuals;
- Please note, within the [Grants.gov](https://www.grants.gov) forms, applicants will be asked to submit information relevant to specific “programs you are applying for”. This refers to the “topic area,” see section 8.0, to which you are submitting your USDA SBIR application;

- PDF documents submitted as a part of the application must also adhere to the following guidelines or risk being excluded from review:
 1. Margins not less than 1”or 2.5 cm on all sides;
 2. Type no less than 12 point font size regardless of whether it is single or double spaced;
 3. Font type should be “Times New Roman, Geneva, Helvetica, or Arial”; and
 4. Tables and graphics may be included; text for captions, headings and graphic explanations must not be smaller than 9 point and must be the same font type as the rest of the application.

- APPLICATIONS RECEIVED AFTER THE SPECIFIED CLOSING DATE AND TIME, NOT MEETING ELIGIBILITY REQUIREMENTS AS DESCRIBED IN SECTION 1.4, OR NOT IN COMPLIANCE WITH APPLICATION GUIDELINES PROVIDED IN THIS PROGRAM SOLICITATION **WILL BE AT RISK OF BEING EXCLUDED** FROM NIFA REVIEW.

******* PLEASE READ *******

Section 3.0 of this program solicitation provides additional information that is specific to the USDA SBIR program. Applicants are advised to refer to this program solicitation to determine the specific information that is required during the submission of the application to Grants.gov. **The information in this program solicitation supersedes any information provided in the NIFA Application Guide.**

Helpful Information for Submission	Website Address
Applications should be submitted through the Grants.gov website.	Grants.gov
The NIFA Grants.gov Application Guide provides guidance for completing the forms required by Grants.gov and NIFA. Used in conjunction with the program solicitation, this guide will assist applicants with most field-specific questions.	Contained within the application package is the “NIFA Grants.gov Application Guide: A Guide for Preparation and Submission of NIFA Applications via Grants.gov.” This Guide contains an introduction and general Grants.gov instructions, information about how to use a Grant Application Package in Grants.gov, and instructions on how to complete the application forms. Applicants should reference this program solicitation for additional guidance not found in the application guide.

If you have any questions related to preparing application content, contact the NIFA Help Desk:
 Email: electronic@nifa.usda.gov
 Phone: 202-401-5048, Business hours are M-F, 7:00 am – 5:00 pm ET, excluding Federal holidays.

If you have any questions related to Grants.gov content, contact the Grants.gov Help Desk:
 Email: support@grants.gov
 Toll Free: 1-800-518-4726, Hours of Operation: 24 hours a day, 7 days a week, excluding Federal holidays.

In order to view the Grants.gov forms you will have to have a compatible version of Adobe Reader. To determine if your computer has the correct version of Adobe Reader, go to http://www.grants.gov/help/download_software.jsp.

If you do not own PDF-generating software, Grants.gov provides online tools to assist applicants. On the Grants.gov Customer Support Webpage (<http://grants.gov/CustomerSupport>) users will find a link to “Convert Documents to PDF” (<http://grants.gov/assets/PDFConversion.pdf>). PDF documents submitted as a part of the application must also adhere to the following guidelines:

*******PLEASE READ*******
IMPORTANT CHANGES FOR FY 2012

NIFA Societal Challenge Areas

The National Institute of Food and Agriculture (NIFA) has identified five primary societal challenge areas and proposals are strongly encouraged that address one or more of these societal challenge areas. The five areas are 1) Global Food Security and Hunger, 2) Climate Change, 3) Sustainable Bioenergy, 4) Childhood Obesity, and 5) Food Safety.

Applicants should note that the USDA SBIR program offers a Phase I commercialization program and the SBIR program will set aside the funds for each awardee to participate in this program.

Government Wide Research Priority Areas

The USDA recognizes **Agriculturally-related Manufacturing Technology** and **Energy Efficiency and Alternative and Renewable Energy** as two cross-cutting priorities with relevance to all topic areas listed in Section 8.0 of this program solicitation. USDA encourages applicants—as appropriate—to address these priorities within their applications for submission to one of the topic areas listed in Section 8.0. Special consideration will be given to applications that address one of these priorities under the Project Narrative, section (2) Responsiveness to USDA SBIR Program Priorities and Societal Challenge Areas.

Agriculturally-related Manufacturing Technology

On February 26, 2004, the President issued Executive Order 13329 (69 FR 9181) entitled “Encouraging Innovation in Manufacturing.” In response to this Executive Order, USDA encourages the submission of applications that deal with some aspect of agriculturally-related manufacturing technology (Section 2.17). Since manufacturing impacts all aspects of agriculture and rural development, applications dealing with manufacturing could be submitted to any of the topic areas. If an application has a connection to manufacturing this should be indicated in the R&R Other Project Information form (Field 8(2)) and a brief explanation of how it is related to manufacturing should be provided.

Energy Efficiency and Alternative and Renewable Energy

In an effort to find alternatives to fossil fuels and to reduce overall energy usage, the USDA established research on energy efficiency and alternative and renewable energy as a high priority. Such research includes development of new energy crops, improved methods for producing biofuels, such as ethanol, butanol and biodiesel, producing hydrogen and other fuel gases from agricultural waste, and more efficient use of energy in agricultural production and in rural communities. Energy issues impact all aspects of agriculture and rural development and thus applications dealing with energy efficiency and alternative and renewable energy could be submitted any of the topic areas. If an application has a connection to energy efficiency or alternative and renewable energy this should be indicated in the R&R Other Project Information form (Field 8(2)) and a brief explanation of how it is related to energy efficiency and alternative and renewable energy should be provided.

NIFA Societal Challenge Areas

The USDA National Institute for Food and Agriculture (NIFA) has identified five primary societal challenge areas around which to structure departmental research and development programs. Special consideration will be given to applications that address one of these priorities under the Project Narrative, section (2) Responsiveness to USDA SBIR Program Priorities and Societal Challenge Areas.

1) Global Food Security and Hunger

New technologies are needed to boost food production by developing improved sustainable production systems, develop better ways to protect agricultural production systems from diseases and pests, and develop innovative ways to enhance food accessibility to vulnerable populations.

2) Climate Change

New technologies are needed to enable agricultural producers to develop better mitigation strategies aimed at reducing greenhouse gas emissions and increasing carbon sequestration, and to develop better approaches for adapting to climate change by reducing carbon, nitrogen and water footprints and developing new plant cultivars and animal breeds adapted to changing environmental conditions.

3) Sustainable Bioenergy

New technologies are needed to convert biomass to biofuels, design optimum biomass for sustainable bioenergy production systems, and to produce value-added biobased industrial products derived from agricultural materials in order to reduce the U.S. dependence on foreign oil and achieve energy independence.

4) Childhood Obesity

New technologies are needed to ensure that nutritious foods are affordable and available and that individuals and families are able to make informed decisions about their health and well being in order to reduce the prevalence of obesity among children and adolescents.

5) Food Safety

New technologies are needed to reduce the incidence of food-borne illnesses and death through a safe food supply, improve our ability to detect food-borne pathogens, and develop improved food processing technologies.

The following chart illustrates the relationships among the five societal challenge areas and the ten research topic areas listed in Section 8.0. Applications that address one or more of the societal challenge areas as it relates to a particular topic area are encouraged. When an application addresses one or more of the societal challenge areas this fact should be clearly stated as directed in the Project Narrative.

	Topic Areas*									
	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.12	8.13
Food Safety		x	x		x	x	x		x	x
Childhood Obesity					x	x				
Climate Change	x	x	x		x	x	x	x		
Food Security		x	x	x		x	x		x	x
Sustainable Energy	x					x		x	x	

***Topic Areas:** 8.1-Forests and Related Resources; 8.2-Plant Production and Protection - Biology; 8.3-Animal Production and Protection; 8.4-Air, Soil and Water Resources; 8.5-Food Science and Nutrition; 8.6-Rural and Community Development; 8.7-Aquaculture; 8.8- Biofuels and Biobased Products; 8.12-Small and Mid-Size Farms; 8.13-Plant Production and Protection - Engineering

USDA'S PROGRAM SOLICITATION SMALL BUSINESS INNOVATION RESEARCH FISCAL YEAR 2012

1.0 GENERAL PROGRAM DESCRIPTION

1.1 Introduction

The U.S. Department of Agriculture (USDA) invites science-based small business firms to submit research applications under this program solicitation entitled "Small Business Innovation Research Program (SBIR), Fiscal Year 2012." Firms with strong scientific research capabilities in any of the topic areas described in section 8.0 are encouraged to participate. USDA will support high-quality research or research and development (R/R&D) applications containing advanced concepts related to important scientific problems and opportunities that could lead to significant public benefit.

Objectives of the SBIR program include stimulating technological innovation in the private sector, strengthening the role of small businesses in meeting Federal research and development needs, increasing private sector commercialization of innovations derived from USDA-supported research and development efforts and fostering and encouraging participation by women-owned and socially and economically disadvantaged small business firms in technological innovation.

This RFA is being released prior to Congressional reauthorization of the program and the passage of an Appropriations Act for FY 2012. Enactment of Continuing Resolutions or an Appropriations Act may affect the availability or level of funding for this program.

1.2 Three-phase Program

The USDA SBIR program is carried out in three separate phases. Phase I is to determine the scientific or technical feasibility of ideas submitted by applicants on research topic areas described in section 8.0 of this solicitation. **This program solicitation is only for the preparation and submission of Phase I applications.** Phase I awards may not exceed \$100,000.00 for a period normally not to exceed eight (8) months. However, longer grant periods, up to 20 months, may be considered when appropriate. The Phase I application should concentrate on research that will significantly contribute to **proving the scientific or technical feasibility** of the approach or concept and will be a prerequisite to further USDA support in Phase II.

Phase II applications promote principal R/R&D and will require a more comprehensive application, outlining the proposed effort in detail. All companies that have Phase I projects will be able to submit a Phase II application at the conclusion of the Phase I grant period. At the appropriate time, the SBIR program will provide Phase I awardees with instructions for preparing these applications and a deadline date (normally early February of each year) for submitting applications. USDA recognizes that Phase II awards may not be sufficient in either dollars or time for the firm to complete the total R/R&D required to bring the project results to commercialization in the market place. Therefore, completion of the research under these circumstances may have to be carried into Phase III.

The purpose of Phase III is to stimulate technological innovation and the national return on investment from research through the pursuit of commercialization objectives resulting from the USDA-supported work carried out in Phases I and II. No Federal SBIR funds may be used to support Phase III projects.

However, firms are strongly encouraged to secure Phase III funding from their own resources or from other public and private sources.

This program solicitation is issued pursuant to the Small Business Innovation Development Act of 1982, Pub. L. No. 97-219, as amended (15 U.S.C. 638) and Section 630 of the Act making appropriations for Agriculture, Rural Development and Related Agencies' programs for fiscal year ending September 30, 1987, and for other purposes, as made applicable by Section 101(a) of Pub. L. No. 99-591, 100 Stat. 3341. This program is administered by the NIFA – National Institute of Food and Agriculture (NIFA) of the USDA.

This program is subject to the provisions found at 7 CFR Part 3403. These provisions set forth procedures to be followed when submitting grant applications, rules governing the evaluation of applications and the awarding of grants, and regulations relating to the post-award administration of grant projects. Changes have been made to the provisions and incorporated into this solicitation. These changes were subject to the comments provided in response to the Small Business Innovation Research Grants Program – Final Rule (72 FR 20702, April 26, 2007).

This SBIR program funding opportunity for FY 2012 Phase I applications has a closing date of September 1, 2011.

1.3 Potential Commercial Outcome

In addition to supporting scientific research and development, the program's primary goal is to provide incentive and opportunity for small business firms to convert USDA-sponsored research to technological innovation in the private sector. All proposed research should have some potential commercial outcome. Phase I applications should contain a brief description of any potential commercial application(s) and whether or not the small business firm will attempt to secure follow-on, non-SBIR funding to pursue the commercial development of the expected products from the proposed research (See Section 3.3.3 R&R Other Project Information (10) – Potential Post Application).

1.4 Eligibility

Each applicant submitting an application must qualify as a small business concern for R/R&D purposes at the time of award, (see definitions in section 2.0). A potential grantee that is a subsidiary must show that the parent company is also a small business entity and the parent company must provide documentation supporting their small business status (the documentation should be included in Field 12, Other Attachments, of the Research and Related (R&R) Other Project Information form). If the parent company is not a small business entity, then the subsidiary is not eligible to submit an SBIR application. In addition, the primary employment of the Project Director (PD) must be with the small business concern at the time of award and during the conduct of the proposed research, unless otherwise approved in writing by the USDA Authorized Departmental Officer (ADO) after consultation with the appropriate National Program Leader (NPL). Primary employment means that more than one-half of the PD's time is spent in the employ of the small business. Primary employment with the small business precludes the applicant as a full-time employee with another organization. This requirement applies to Phase I awards and any deviations from this requirement must be approved in writing by the ADO after consultation with the appropriate NPL. While the PD must work more than one-half of his/her time for the small business during the entire grant period, there is no minimal time requirement for what percentage of the PD's time is spent working on the proposed research.

To be eligible to receive awards from the USDA's SBIR program, a business concern must meet the requirements of paragraphs (A) and (B) below:

(A) Ownership and control.

1. An SBIR awardee must;
 - a. Be a concern which is at least 51 percent owned and controlled by one or more individuals who are citizens of the United States or permanent resident aliens in the United States; or
 - b. Be a concern which is at least 51 percent owned and controlled by another business concern that is itself at least 51 percent owned and controlled by individuals who are citizens of or permanent resident aliens in the United States; or
 - c. Be a joint venture in which each entity to the venture must meet the requirements set forth in either paragraphs (A)(1)(a) or (A)(1)(b) of this section.
2. If an Employee Stock Option Plan owns all or part of the concern, USDA considers each stock trustee and plan member to be an owner.
3. If a trust owns all or part of the concern, USDA considers each trustee and trust beneficiary to be an owner.

(B) Size.

An SBIR awardee, together with its affiliates, must not have more than 500 employees. The small business concern must be the primary performer of the proposed research effort. In Phase I, a minimum of **two-thirds** of the research or analytical work, as determined by budget expenditures, must be performed by the proposing organization. Occasionally, deviations from this requirement may occur, and must be approved in writing by the ADO after consultation with the USDA SBIR NPL.

Also, for Phase I, the R/R&D work must be performed in the United States. On rare and unique circumstance, for example, a supply, material or project requirement not available in the United States, agencies may allow that particular portion of the R/R&D work to be performed or obtained in a country outside of the United States. Approval, in writing, is necessary by both the responsible NPL and the ADO for such specific conditions.

1.5 Agency Contacts

Applicants and other interested parties are encouraged to contact the SBIR NPL indicated for more information about each topic area listed below.

Dr. Charles Cleland (ccleland@nifa.usda.gov)

Telephone: (202) 401- 6852

Fax: (202) 401- 6070

8.1 Forests and Related Resources

8.4 Air, Water and Soils

8.7 Aquaculture

8.12 Small and Mid-Size Farms

Dr. William Goldner (wgoldner@nifa.usda.gov)

Telephone: (202) 401- 1719

Fax: (202) 401- 6070

8.2 Plant Production and Protection - Biology

8.8 Biofuels and Biobased Products

8.13 Plant Production and Protection - Engineering

Dr. Siva Sureshwaran (ssureshwaran@nifa.usda.gov)

Telephone: (202) 720 - 7536

Fax: (202) 401- 6070

8.6 Rural Development

Dr. Dionne Toombs (dtoombs@nifa.usda.gov)

Telephone: (202) 401- 2138

Fax: (202) 401- 6070

8.5 Food Science and Nutrition

Dr. Adele Turzillo (aturzillo@nifa.usda.gov)

Telephone: (202) 401 - 6158

Fax: (202) 401- 6070

8.3 Animal Production and Protection

Questions of a general nature about this SBIR solicitation should be sent to sbir@nifa.usda.gov or can be directed to:

Mr. Scott Dockum (sbir@nifa.usda.gov)

Telephone: (202) 401- 4002 or (202) 401- 4995

Fax: (202) 401- 6070

Program Specialist – Small Business Innovation Research (SBIR)

2.0 DEFINITIONS

The following definitions apply for purposes of this solicitation:

2.1 Ad hoc Reviewers

Experts qualified by training and experience in particular scientific or technical fields, who are solicited to render advice on the scientific technical merit of grant applications on an individual basis and also submit written evaluations of specific grant applications.

2.2 Applicant

The organizational entity that, at the time of award, will qualify as a small business concern and that submits a grant application for a funding agreement under the SBIR Program.

2.3 Authorized Departmental Officer

The authorized departmental officer (ADO) is the Secretary or any employee of the Department who has the authority to issue or modify grant instruments on behalf of the Secretary

2.4 Authorized Representative

The authorized representative (AR) is the president, director, chief executive officer or other designated official of the applicant small business concern who has the authority to commit the resources of the organization.

2.5 Budget Period

Each project is divided into different intervals of time for budgetary and reporting purposes.

2.6 Commercialization

The process of developing marketable products or services as well as producing and delivering products or services for sale, whether by the originating party or by others, to Government or commercial markets.

2.7 Department

The U. S. Department of Agriculture.

2.8 Direct Costs

Costs that occur in direct support of a single project and can be clearly identified, segregated and billed directly to the contract via the companies' accounting system.

2.9 Essentially Equivalent Work

Occurs when (1) substantially the same research is proposed for funding in more than one grant application submitted to the same Federal agency; (2) substantially the same research is submitted to two or more different Federal agencies for review and funding consideration; or (3) a specific research objective and the research design for accomplishing an objective are the same or closely related in two or more applications or awards, regardless of the funding source.

2.10 Fee

The amount of profit a company will receive from the grant.

2.11 Full Announcement

A formal request for applications whereby a Federal agency notifies the small business community of its research or Research and Development (R&D) needs and interests in broad and selected areas as appropriate to the agency and requests applications from small business concerns in response to these needs and interests.

2.12 Funding Agreement

A funding agreement is any contract, grant or cooperative agreement entered into between any Federal agency and any small business concern for the performance of experimental, developmental or research work, including products or services funded in whole or in part by the Federal Government.

2.13 Grant

A financial assistance mechanism providing money, property or both to an eligible entity to carry out the approved project or activity. Substantial programmatic involvement by Government is not anticipated.

2.14 Grantee

The small business concern designated in the grant award document as the responsible legal entity to whom the grant is awarded under this part. Also referred to as an “awardee.”

2.15 Historically Underutilized Business Zone (HUBZone)

A small business concern meeting the following criteria:

(A) Located in a “historically underutilized business zone” or HUBZone area located in one or more of the following:

- (1) **A qualified census tract** (as defined in section 42(d)(5)(C)(i)(I) of the Internal Revenue Code of 1986); or
- (2) **A qualified “non-metropolitan county”** (as defined in section 143(k)(2)(B) of the Internal Revenue Code of 1986); or

(3) On an Indian Reservation- Land within the boundaries of a federally recognized Indian Reservation.

(B) Owned and controlled by one or more U.S. Citizens; and

(C) At least 35 percent of its employees must reside in a HUBZone.

2.16 Indirect Costs

Costs which occur in support of more than one project, often called overhead or General & Administrative (G&A).

2.17 Innovation

A new or improved item having marketable potential including (1) development of new technologies; (2) refinement of existing technologies; or (3) development of new applications for existing technologies.

2.18 Intellectual Property

The separate and distinct types of intangible property that are referred to collectively as “intellectual property,” including but not limited to: patents, trademarks, copyrights, trade secrets, SBIR technical data (as defined in this section), ideas, designs, know-how, business, technical and research methods, other types of intangible business assets, and all types of intangible assets either proposed or generated by a small business concern as a result of its participation in the SBIR program.

2.19 Joint Venture

An association of concerns with interests in any degree or proportion by way of contract, express or implied, consorting to engage in and carry out a single specific business venture for joint profit, for which purpose they combine their efforts, property, money, skill or knowledge, but not on a continuing or permanent basis for conducting business generally. A joint venture is viewed as a business entity in determining power to control its management.

2.20 Manufacturing Related

Encompasses improvements in existing methods or processes as well as wholly new processes, machines, or systems. Four main areas include:

(A) Unit process level technologies that create or improve manufacturing processes, including:

1. Fundamental improvements in existing manufacturing processes that deliver substantial productivity, quality, or environmental benefits; or
2. Development of new manufacturing processes, including new materials, coatings, methods, and associated practices.

(B) Machine level technologies that create or improve manufacturing equipment, including:

1. Improvements in capital equipment that create increased capability, such as accuracy or repeatability, increased capacity through productivity improvements or cost reduction or increased environmental efficiency, such as safety, energy efficiency and, environmental impact; or
2. New apparatus and equipment for manufacturing, including additive and subtractive manufacturing, deformation and molding, assembly and test, semiconductor fabrication, and nanotechnology.

(C) Systems level technologies for innovation in the manufacturing enterprise, including:

1. Advances in controls, sensors, networks, and other information technologies that improve the quality and productivity of manufacturing cells, lines, systems, and facilities;
2. Innovation in extended enterprise functions critical to manufacturing, such as quality systems, resource management, supply change integration and distribution, scheduling, and tracking; or
3. Technologies that enable integrated and collaborative product and process development, including computer-aided and expert systems for design, tolerancing, process and materials selection, life-cycle cost estimation, rapid prototyping, and tooling.

(D) Environment or societal level technologies that improve workforce abilities, productivity, and manufacturing competitiveness, including:

1. Technologies for improved workforce health and safety, such as human factors and ergonomics; or
2. Technologies that aid and improve workforce manufacturing skill and technical excellence, such as educational systems incorporating improved manufacturing knowledge and instructional methods.

2.21 NIFA

The National Institute of Food and Agriculture.

2.22 Outcomes

The measure of long-term, eventual program impact.

2.23 Outputs

The measures of near-term program impact.

2.24 Peer Review Group

Experts or consultants, qualified by training and experience in particular scientific or technical fields, that provide advice on the scientific and technical merit of grant applications. The group assembles to discuss and evaluate all of the eligible applications submitted to this program in their area of expertise.

2.25 Program Solicitation

A formal request for applications whereby a Federal agency notifies the small business community of its research or Research and Development (R&D) needs and interests in broad and selected areas, as appropriate to the agency, and requests applications from small business concerns in response to these needs and interests.

2.26 Project Director / Principal Investigator (PD/PI)

The one individual designated by the applicant to provide the scientific and technical direction to a project supported by the funding agreement.

2.27 Prototype

A model of something to be further developed, which includes designs, protocols, questionnaires, software, and devices.

2.28 Project Period

The total length of time approved by the Department for conducting the research project as outlined in an approved grant award.

2.29 Research or Research and Development (R/R&D)

R/R&D means any activity which is:

- (1) A systematic, intensive study directed toward greater knowledge or understanding of the subject studied;
- (2) A systematic study directed at applying new knowledge to meet a recognized need; or
- (3) A systematic application of knowledge toward the production of useful materials, devices and systems or methods, including design, development and improvement of prototypes, and new processes to meet specific requirements.

2.30 Research Project Grant

The award by the Department to a grantee to assist in meeting the costs of conducting an identified project, which is intended and designed to establish, discover, elucidate, or confirm information or the underlying mechanisms relating to a research topic area identified in the annual solicitation of applications.

2.31 SBIR Participants

Business concerns that have received SBIR awards or that have submitted SBIR applications.

2.32 SBIR Technical Data

All data generated during the performance of an SBIR award.

2.33 SBIR Technical Data Rights

The rights a small business concern obtains in data generated during the performance of any SBIR award that an awardee delivers to the Government during or upon completion of a Federally-funded project and to which the government receives a license.

2.34 Small Business Concern (SBC)

SBC means a concern that, on the date of award for Phase I or Phase II funding agreements:

- (1) is organized for profit, with a place of business located in the United States, which operates primarily within the United States or which makes a significant contribution to the United States economy through the payment of taxes or use of American products, materials, or labor;
- (2) is in the legal form of an individual proprietorship, partnership, limited liability company, corporation, joint venture, association, trust or cooperative, except that where the form is a joint venture, there can be no more than 49 percent participation by foreign business entities in the joint venture;
- (3) is at least 51 percent owned and controlled by one or more individuals who are citizens of or permanent resident aliens in, the United States, except in the case of a joint venture, where each entity in the venture must be 51 percent owned and controlled by one or more individuals who are citizens of or permanent resident aliens in the United States; and
- (4) has, including its affiliates, not more than 500 employees. The term “affiliates” is defined in greater detail in 13 CFR 121.103. The term “number of employees” is defined in 13 CFR 121.106.

2.35 Small and Mid-Size Farms

Small Farms are defined as farms or ranches with less than \$250,000 in annual agricultural sales. Mid-Size Farms are defined as farms or ranches with less than \$500,000 in annual agricultural sales.

2.36 Socially and Economically Disadvantaged Small Business Concern

A socially and economically disadvantaged small business concern is one:

- (1) Which is at least 51 percent owned by (i) an Indian tribe or a native Hawaiian organization or (ii) one or more socially and economically disadvantaged individuals; and
- (2) Whose management and daily business operations are controlled by one or more socially and economically disadvantaged individuals.

For purposes of this solicitation, a socially and economically disadvantaged individual is defined as a member of any of the following groups: Black Americans, Hispanic Americans, Native Americans, Asian-Pacific Americans, Subcontinent Asian Americans, other groups designated from time to time by the Small Business Administration (SBA) to be socially disadvantaged, or any other individual found to

be socially and economically disadvantaged by the SBA pursuant to Section 8(a) of the Small Business Act, 15 U.S.C. 637(a).

Note: The certification of socially and economically disadvantaged small business is for statistical purposes only.

2.37 Subcontract

Any agreement, other than one involving an employer-employee relationship, entered into by an awardee of a funding agreement calling for supplies or services for the performance of the original funding agreement.

2.38 United States

United States means the 50 states, the territories and possessions of the Federal Government; the Commonwealth of Puerto Rico; the District of Columbia; the Republic of the Marshall Islands; the Federated States of Micronesia; and the Republic of Palau.

2.39 Women-owned Small Business Concern

A women-owned small business concern is one:

- (1) Which is at least 51 percent owned by one or more women; and
- (2) Whose management and daily business operations are controlled by one or more women.

Note: Certification of women-owned small business is for statistical purposes only.

3.0 APPLICATION PREPARATION INSTRUCTIONS AND REQUIREMENTS

3.1 Application Requirements

Applications must address only scientific research activities. **A small business must not propose technical assistance, demonstration projects, classified research, or financial assistance to start or create a company or patent applications.** Many of the research projects supported by the SBIR program lead to the development of new products based upon the research results obtained during the project. However, projects that seek funding solely for product development where no research is involved (i.e., the funds are needed to permit the development of a product based on previously completed research) will not be accepted. Research may be carried out through the construction and evaluation of a laboratory prototype, where necessary.

Literature surveys should be completed prior to the Phase I application and should not be proposed as part of the R&D effort. Applications that deal principally with developing proven concepts for commercial markets or scaling up previously developed prototypes for commercial production should not be submitted. Such efforts are considered the responsibility of the private sector and therefore are not supported by USDA. An application must be limited to only one research problem.

Applicants may respond to any of the topic areas listed under section 8.0. **The same application, however, may not be submitted under more than one topic area.** In the event that the proposing organization wishes to submit additional applications with a different research focus, the USDA SBIR program allows organizations to submit separate applications under different topic areas or different applications under the same topic area outlined in this solicitation. Where similar research is discussed under more than one topic area, the applicant should choose the topic area description that is most relevant to the applicant's research concept. **Duplicate applications will not be reviewed.**

The purpose of a research application is to provide a written statement that contains sufficient information to persuade members of the research community who review the application and then advise the USDA SBIR professional staff that the proposed research is a sound approach to an important scientific question and is worthy of support under the stated USDA evaluation criteria (see section 4.0). The application should be self-contained and written with the care and thoroughness accorded papers for publication. Each application should be reviewed carefully by the applicant prior to submission and by others knowledgeable on the subject to ensure inclusion of data essential for comprehensive evaluation.

3.2 USDA SBIR Application Submission Overview

For all FY 2012 applications, the USDA SBIR program will require electronic application submission through Grants.gov (www.grants.gov). Submission through Grants.gov requires the use of forms located at the Grants.gov Website. Applications not submitted electronically are not eligible to be considered for a Phase I SBIR award and will not be reviewed.

Please note the USDA NIFA has developed both this Full Announcement and a NIFA document titled "A Guide for Preparation and Submission of NIFA Applications via Grants.gov," also known as the "NIFA Application Guide," to assist in completing the application forms. Section 3.0 of this program solicitation provides additional information that is specific to the USDA SBIR program. Applicants are advised to refer to this program solicitation to determine if specific information is required during the submission of the forms on Grants.gov. **If directed by this program solicitation**

to provide information that is different from other documents, the information in this program solicitation supersedes in all cases.

To access the electronic application package via Grants.gov, go to www.grants.gov, under the “Apply for Grants” heading on the left side of page and click on “Download Grant Application Packages.” Enter the CFDA number (i.e., 10.212) in the appropriate box to search by Catalog of Federal Domestic Assistance (CFDA) number. **From the search results, select the item with CFDA number 10.212, Small Business Innovation Research.** Applicants can also access the appropriate page on Grants.gov by visiting the USDA SBIR funding opportunity page at <http://www.nifa.usda.gov/fo/sbir>. Clicking on the Funding Opportunity Number listed near the bottom of the page will link the applicant directly to the information and forms necessary to submit through [Grants.gov](http://www.grants.gov).

In order to access, complete and submit applications, applicants must download and install a version of Adobe Reader compatible with Grants.gov. This software is essential to apply for NIFA Federal assistance awards. For basic system requirements and download instructions, please see http://www.grants.gov/help/download_software.jsp. To verify that you have a compatible version of Adobe Reader, Grants.gov established a test package that will assist you in making that determination. Grants.gov Adobe Versioning Test Package:
<http://www.grants.gov/applicants/AdobeVersioningTestOnly.jsp>.

3.2.1 Resources

Online

There are considerable online resources to help potential applicants with the electronic forms and submission requirements. The “Get Registered” tab on Grants.gov (http://www.grants.gov/applicants/get_registered.jsp) provides information on registering your company with Grants.gov and the steps necessary to apply for a grant. A quick reference guide listing these steps is available as a four-page PDF document at the following website:
<http://www.grants.gov/section910/Grants.govRegistrationBrochure.pdf>.

In addition, NIFA has developed documentation to help navigate these electronic processes. The central point for all information related to the electronic submission for the USDA SBIR program is http://www.nifa.usda.gov/funding/application_info.html. This site is updated frequently and it should be checked often for program-specific help concerning electronic submission of USDA SBIR grants. As stated above, one of the principal resources available is the NIFA Application Guide, which provides guidance for completing the forms required by Grants.gov and NIFA. Used in conjunction with this program solicitation, the NIFA Application Guide will assist applicants with questions related to the fields located within each form that do not have specific SBIR directions.

Personalized

Questions about the registration process through Grants.gov, versions of Adobe Reader, PDF files, completing and submitting electronically, or technical problems related to the Grants.gov Website should be directed to Grants.gov staff. They can be reached by phone at **1-800-518-GRANTS** or via email at support@grants.gov.

Answers to field-specific questions about the SF-424 (R&R) forms package should be found in either this program solicitation or the NIFA Application Guide.

If you are unable to find the answer that you need, please send an email to electronic@nifa.usda.gov with your question. Make sure to identify the form name, the field number related to your question and indicate that you will be applying to the USDA SBIR program.

Any program-specific questions concerning the USDA SBIR program, such as the appropriateness of your proposed research or work plan, should be directed to the NPL responsible for the topic area where you wish to submit your application, see section 8.0. For general questions you can also contact the USDA SBIR office at sbir@nifa.usda.gov or 202-401-4002.

3.2.2 Registration Procedures for Companies and Individuals

The registration procedure for companies or individual proprietorships intending to submit a grant application through Grants.gov requires several steps and must be finished prior to submitting an application. **The registration process can take as long as several weeks to complete so it is critical that companies begin this process as soon as possible. Companies that have previously registered with Grants.gov must contact Grants.gov to ensure that the company's registration is updated and complete prior to submission. Grants.gov now requires all companies to update their registration on an annual basis.**

Listed below are the steps necessary to submit an application through Grants.gov. More information about these steps is available at http://www.grants.gov/applicants/get_registered.jsp. A quick reference guide listing these steps is available as a four-page PDF document at the following website: <http://www.grants.gov/section910/Grants.govRegistrationBrochure.pdf>.

STEP 1 – Register Your Organization

Obtain your organization's Data Universal Number System (DUNS) number

A DUNS number is a unique number that identifies an organization. It has been adopted by the Federal government to help track how Federal grant money is distributed. If your organization does not have a DUNS number, call the special Dun & Bradstreet hotline at 1-866-705-5711 to receive one free of charge. You will receive a DUNS number within several days of your request. **Please note, individual proprietorships (i.e. farmers, ranchers) can request and receive a DUNS number, but must register with Grants.gov as an organization, not as an individual.**

Register your organization with Central Contractor Registry (CCR)

The CCR is the central government repository for organizations working with the Federal government. If your organization is not already registered, identify the primary contact who should register your organization. When your organization registers with CCR, it will be required to designate an e-Business Point of Contact (e-Business POC). The e-Business POC authorizes individuals to submit grant applications on behalf of the organization and creates a special password called a Marketing Partner ID Number (M-PIN) to verify individuals authorized to submit grant applications for the organization. Visit the CCR Web site at <http://www.ccr.gov> to begin this process. It may take several days to collect the information needed for your organization's registration. The CCR Assistance Center can be reached at 888-227-2423.

STEP 2 – Register an Authorized Representative (AR) for your Company

Obtain your username and password

To safeguard the security of your electronic information, and to submit a Federal grant application via Grants.gov, you must first obtain a username and password from the Grants.gov Credential Provider. Register with Grants.gov's Credential Provider at

http://www.grants.gov/applicants/register_credential_provider.jsp. You will need to enter your organization's DUNS number to access the registration form. Once you complete the registration form you will be given your username and you will create your own password.

Register with Grants.gov

After obtaining your username and password, allow 30 minutes for your data to transfer from the Credential Provider. Register with Grants.gov to set up a short AR profile. Visit http://www.grants.gov/applicants/register_grants.gov.jsp to register your username and password and set up your profile. You will only be authorized for the DUNS number that you register in your Grants.gov profile.

STEP 3 – Become Authorized as an AR

Obtain your e-Business POC authorization

After the AR profile is completed, your organization's e-Business POC will receive an email regarding your requested AR registration with links and instructions to authorize you as an AR. Instruct your e-Business POC to login to Grants.gov at http://www.grants.gov/applicants/e_biz.jsp and enter your organization's DUNS number and M-PIN. The e-Business POC will be authorized as an AR and will be the individual verified to submit grant applications. You can check your AR status by logging in to Grants.gov at <http://www.grants.gov/applicants/applicants.jsp>. The person authorized as the AR must have the authority to commit resources and provide various certifications and assurances related to your organization.

3.2.3 Special Considerations

Throughout the program solicitation, the following is specified, “Attachment Format – (PDF Format is Required).” Applicants should note that the attachments must be in the PDF format. It is the responsibility of the applicant to correctly submit the attachments in the correct format. Grants.gov will not check the application for adherence to this requirement at the time of submission.

USDA SBIR electronic application submissions consist of Adobe forms and PDF attachments.

THE USDA SBIR PROGRAM WILL ONLY ACCEPT ATTACHMENTS IN PDF.

If you do not own PDF-generating software, Grants.gov provides online tools to assist applicants. On the Grants.gov Customer Support Web page (<http://grants.gov/CustomerSupport>), users will find a link to “Convert Documents to PDF” (<http://grants.gov/assets/PDFConversion.pdf>). PDF documents submitted as a part of the application must also adhere to the following guidelines:

- margins not less than 1 inch; 2.5 cm on all sides;
- type no smaller than 12 point font size regardless of whether it is single or double spaced;
- Font type should be Times New Roman, Geneva, Helvetica, Arial; and
- Tables and graphics may be included; text for captions, headings and graphic explanations must not be smaller than 9 point and must be the same font type as the rest of the application.

ANY PROPOSALS CONTAINING NON-PDF DOCUMENTS WILL BE AT RISK OF BEING EXCLUDED FROM NIFA REVIEW Incomplete applications will also be excluded from NIFA review.

Page Limitations

Applications submitted electronically via Grants.gov consist of forms and PDF attachments. **Page limitations for certain attachments must be followed, see section 3.3. APPLICATIONS THAT DO NOT FOLLOW THE PAGE LIMITS OUTLINED IN SECTION 3.3 ARE NOT ELIGIBLE TO BE CONSIDERED FOR A PHASE I SBIR AWARD AND WILL BE EXCLUDED FROM NIFA REVIEW.**

Changes, Additions or Corrections

Modifications to the application will not be accepted after the closing date of this program solicitation. Under some circumstances, changes, additions, or corrections may be necessary to an application submitted to the USDA SBIR program via Grants.gov **before the specified program solicitation closing date.** Modifications to applications will require a resubmission of the entire application package and the applicant must notify the program at sbir@nifa.usda.gov of the resubmission. **Submitting changes to Grants.gov without contacting the program could significantly delay your application submission and may result in the application not being reviewed.**

3.3 Application Guidelines

Those who wish to submit an application to the USDA SBIR program should submit the following components and associated attachments via Grants.gov.

If there is a discrepancy between the program solicitation and the NIFA Application Guide, the information contained in this program solicitation is overriding.

Below are instructions for completing each field within each of the forms required in the application package. Page limitations indicated in bold are appropriate for a given section/attachment.

3.3.1 SF-424 R&R Cover Sheet

Information related to the questions on this form is dealt with in detail in Part V, 2 of the NIFA Grants.gov Application Guide unless otherwise noted below.

Field 1. Type of Submission – Applicants must check the “Application” box.

Field 2. Date Submitted and Applicant Identifier – This field is provided for the Applicant’s use if you have an internal tracking system and would like to use it in tracking applications submitted. (This field is not required.)

Field 3. Date received by State and State Application Identifier – This is not applicable for USDA SBIR applications and this field does not need to be completed.

Field 4. Federal Identifier – Applicants must reference the NIFA Application Guide for directions.

Field 5. Applicant Information – Provide all required information detailed in the NIFA Application Guide. **Please note: the USDA SBIR program’s official correspondence will be with either the PD or AR.**

Fields 6 – 11. Employer Identification; Type of Applicant; Type of Application; Name of Federal Agency; Catalog of Federal Domestic Assistance Number (10.212); and Descriptive Title of Applicant’s Project; - Applicants must reference the NIFA Application Guide for directions.

Field 12. Proposed Project Start Date and End Date – The proposed duration of Phase I projects should normally not exceed eight months, except in special, justified circumstances. In most circumstances, the following dates should be used for these fields:

	Start	End
Phase I	5/1/2012	12/31/2012

Fields 13 - 14. Congressional Districts and Project Director/Principal Investigator Contact Information – Applicants must reference the NIFA Application Guide for directions.

Field 15. Estimated Project Funding – Applicants must adhere to the following guidelines when completing field a.

- a. Total Estimated Project Funding – This is the total amount of funds the applicant is requesting from the USDA SBIR program and should match the R&R Budget Request for this solicitation.

Field 16. Is this Application Subject to Review by State Executive Order 12372 Process – Check “No.” The USDA SBIR program is not covered by State Executive Order 12372.

Field 17. Complete Certification – Please refer to the NIFA Application guide for information on the Certifications that are being agreed to by checking this box. Included in the Certifications is the Statement as to Delinquency on Federal Debts. Statement as to Delinquency on Federal Debts by Applicants for Federal Assistance - Pursuant to OMB Circular A-129, (implemented by USDA in 7 CFR Part 3), “Except where required by law or approved by the head of the agency, no award of Federal funds shall be made to an applicant who is delinquent on a Federal debt until the delinquent account is made current or satisfactory arrangements are made between affected agencies and the debtor.” The certification of non-delinquency applies only to the organization requesting financial assistance and not to the individual project director. By checking the Complete Certification box, the applicant is providing the statement of non-delinquency on any Federal debt. For the purposes of this statement, the following definitions of delinquency apply:

- (1) Direct loans – a debt more than 31 days past due on a scheduled payment;
- (2) Grants – recipients of a “Notice of Grants Cost Disallowance” who have not repaid the disallowed amount or who have not resolved the disallowance; and
- (3) Guaranteed and insured loans – recipients of a loan guaranteed by the Federal Government that the Federal Government has repurchased from a lender because the borrower breached the loan agreement and is in default.

Examples of debts include delinquent taxes, audit disallowances, guaranteed and direct student loans, housing loans, farm loans, business loans, Department of Education institutional loans, benefit overpayments, and other miscellaneous administrative debts.

NOTE: An applicant who is delinquent on Federal debts must attach explanatory information detailing all relevant particulars concerning the Federal debt in PDF format in Field 12 Other Attachments.

Field 18. SFLLL or Other Explanatory Document - If applicable, attach the SFLLL or other explanatory documentation per agency instructions.

Field 19. Authorized Representative – Applicants must reference the NIFA Application Guide for directions.

Field 20. Pre-application – This is not applicable to the USDA SBIR program. No attachments should be added.

3.3.2 R&R Project/Performance Site Location(s)

Information related to the questions on this form is dealt with in detail in Part V, 3 of the NIFA Grants.gov Application Guide.

3.3.3 R&R Other Project Information

Information related to the questions on this form is dealt with in detail in Part V, 4 of the NIFA Grants.gov Application Guide unless otherwise noted below.

Fields 1 – 6. Are Human Subjects Involved; Are Vertebrate Animals Used; Is Proprietary/Privileged Information Included...; Does this project have an actual or potential impact on the environment; Is the Research Performance Site Designated, or Eligible to be Designated, as a Historic Site...Does the project involve activities outside the U.S... Applicants must reference the NIFA Application Guide for directions.

Field 7. Project Summary/Abstract – (PDF Format is Required)

1 PAGE is the Page Limit for the Summary/Abstract.

In the technical abstract, include a brief description of the problem or opportunity, project objectives, and a description of the effort. Provide another paragraph discussing the anticipated results and potential commercial applications of the proposed research. **The project summary/abstract of successful applications will be published by USDA and, therefore, should not contain proprietary information. IT IS THE RESPONSIBILITY OF THE APPLICANT TO REVIEW THE ABSTRACT ATTACHMENT FOR PAGE LIMIT AND PDF COMPLIANCE BEFORE SUBMISSION.**

Field 8. Project Narrative – (PDF Format is Required)

16 PAGES is the Page Limit for the Project Narrative (The only exception to this page limit requirement will be found in the directions as noted below under (1) Response to Previous Review.)

NOTE: The USDA SBIR Program encourages applicants to only include information pertaining to the items listed below. Applicants must **not** include additional information such as cover sheets, table of

contents, reference listings, budgets, and appendices unless the applicant intends for these to be considered in the page count.

IT IS THE RESPONSIBILITY OF THE APPLICANT TO REVIEW THE PROJECT NARRATIVE ATTACHMENT FOR PAGE LIMIT AND PDF COMPLIANCE BEFORE SUBMISSION.

- (1) **Response to Previous Review** –This is only required if you are submitting an application in which the project described was previously submitted to the SBIR program, but not funded.

Applicants who are re-submitting an application may use up to 1 PAGE to respond to previous reviews. This additional page will not be counted in the 16 page limit as specified above. Applicants that do not fit these criteria only need to indicate that this section is not applicable in their 16 PAGE narrative.

Please provide a clear statement acknowledging comments from the previous review, indicating revisions, rebuttals, etc. This response is a critical part of the screening criteria as noted in subsection 4.2(G). Furthermore, the revised application should clearly indicate the changes that have been made in the project. Make sure to include the application number of the previous submission at the top of this section.

- (2) **Responsiveness to USDA SBIR Program Priorities and Societal Challenge Areas.** – Please indicate if the application has a connection to agriculturally–related manufacturing technology, energy efficiency and alternative and renewable energy or one or more of the NIFA Societal Challenge Areas; see page 9. Provide a brief explanation of how the application is related to the area indicated.

- (3) **Identification and Significance of the Problem or Opportunity** – Clearly state the specific technical problem or opportunity addressed and its importance.

- (4) **Background and Rationale** – Indicate the overall background and technical approach to the problem or opportunity and the part that the proposed research plays in providing needed results. As a part of this section, it is critical that applications adequately cite relevant scientific literature. **Moreover, all citations provided must be properly referenced in the Bibliography & References Cited attachment (see 3.3.3 – Field 9).**

- (5) **Relationship with Research or Research and Development**

Phase I – Discuss the significance of the Phase I effort in providing a foundation for the follow-on Phase II R&D effort. State the anticipated results of the approach if the project is successful. This should address: (a) the technical, economic, social, and other benefits to the Nation and to users of the results, such as the commercial sector, the Federal Government or other researchers; (b) the estimated total cost of the approach relative to benefits; and (c) any specific policy issues or decisions that might be affected by the results.

- (6) **Technical Objectives** – State the specific objectives of the research or research and development effort. Include the technical questions needed to establish the technical feasibility of the proposed approach.

- (7) **Work Plan** – The work plan must provide an explicit, detailed description of the research or research and development approach. The plan should list the tasks to be performed, **provide**

details of the methodology that would be used to research each task, including statistical analysis, if applicable, and indicate how and where the work will be carried out. The effort should attempt to determine the technical feasibility of the proposed concept. The work plan should be linked with the technical objectives of the research and the questions the effort is designed to answer. **This section should constitute a substantial portion of the project narrative.**

- (8) **Related Research or Research and Development** – Describe significant research or Research and Development (R&D) activities that are directly related to the proposed effort, including any conducted by the Project Director or by the proposing small business concern, how the proposed effort expands on the related work, and any planned coordination with outside sources. **The applicant must persuade reviewers that he or she is aware of related research in the selected subject.** It is critical that the applicant make a convincing case that the proposed research builds upon previous research and, if successful, will lead to the development of a new product, process, service, or technology or to substantial improvement of an existing product, process, service, or technology.
- (9) **Potential Post Application** – Briefly describe the commercialization potential of the proposed research after Phase I funding. In addition, indicate whether there appears to be a potential use of the proposed research by the Federal Government. Include a brief description of the proposing company (e.g., date founded, number of employees, and its field of interest). What are the major competitive products in this field, and what advantages will the proposed research have over existing technology in application, performance, technique, efficiency, or cost?
- (10) **Satisfying the Public Interest** - Specify how the proposed research will satisfy one or more of the following USDA strategic goals: (more information can be found at <http://www.usda.gov/ocfo/usdasp/usdasp.htm>)
- a. Strategic Goal 1: Assist Rural Communities To Create Prosperity So They Are Self-Sustaining, Repopulating, And Economically Thriving
 - b. Strategic Goal 2: Ensure Our National Forests And Private Working Lands Are Conserved, Restored, And Made More Resilient To Climate Change, While Enhancing Our Water Resources
 - c. Strategic Goal 3: Help America Promote Agricultural Production And Biotechnology Exports As America Works To Increase Food Security
 - d. Strategic Goal 4: Ensure That All Of America’s Children Have Access To Safe, Nutritious, And Balanced Meals

Field 9. Bibliography & Cited References – (PDF Format is Required)

Provide a complete list of all references cited in the application. **For each reference, provide the complete name for each author, the year of the publication, full title of the article, name of the journal or book published, volume, and the page numbers.** The references should be listed in alphabetical order using the last name of the first author.

Field 10. Facilities & Other Resources – (PDF Format is Required)

Describe the types, location, and availability of instrumentation and physical facilities necessary to carry out the work proposed. **If university facilities, private facilities, or government laboratories are being used, there must be a letter in the application from the authorized organizational representative of the university, private facility, or government laboratory describing the arrangement and testifying that the facilities will be subject to the exclusive use and control of the applicant.** This letter should be included as a part of Other Attachments, see Field 12 below.

Field 11. Equipment Documentation – (PDF Format is Required)

Describe the types, location, and availability of equipment necessary to carry out the work proposed. Items of equipment to be purchased must be fully justified under this section. When purchasing equipment or a product under the SBIR funding agreement, the small business should purchase only American-made items whenever possible and should normally not exceed 10 percent of the budget request.

Field 12. Other Attachments – (PDF Format is Required)

Additional documentation that may be required for your application should be grouped in this section.

- (1) Use of Facilities or Equipment – If university facilities, private facilities, or government laboratories are being used, there must be a letter in the application from the authorized organizational representative of the university, private facility, or government laboratory describing the arrangement and testifying that the facilities will be subject to the exclusive use and control of the applicant.**
- (2) Outside Services –** Involvement of university, government, or other outside personnel in the planning and research stages of the project as consultants or through subcontracting arrangements is permitted and may be particularly helpful to small business firms that have not previously received Federal research awards. Establishment of a Cooperative Research and Development Agreement (CRADA) with a USDA laboratory or other Federal laboratory may also be beneficial to proposing firms. If the application involves outside consultants, subcontracts, or involvement with a CRADA partner, these arrangements should be described in detail. **Applications must include letters from proposed consultants, subcontractors or CRADA cooperators indicating their willingness to serve in order for such participation to be considered during the application review and evaluation process (see subsection 4.3 as appropriate).**
- (3) Letters of Support –**General letters of support from potential end-users of the technology or from individuals/organizations that want to express support for the application.
- (4) Duration Exceeds Normal Project Period –** The proposed duration of Phase I projects should normally not exceed eight months, except in special, justified circumstances. Where a proposed research project requires more than eight months to complete Phase I, a longer project period, not to exceed twenty months, may be requested. An applicant of a Phase I project with an anticipated duration beyond eight months should specify and justify the length of duration in the application at the time of its submission to USDA.
- (5) Applicant is a Subsidiary –** A potential grantee that is a subsidiary must show that the parent company is also a small business entity and the parent company must provide documentation supporting their small business status. The subsidiary must provide documentation to support its independent viable financial status.
- (6) Statement as to Delinquency on Federal Debts by Applicants for Federal Assistance –** An applicant that is delinquent on Federal debts must attach, in PDF format, explanatory information detailing all relevant particulars concerning the Federal debt.
- (7) Non-Domestic Performance Explanation –** Requests for foreign travel or work are discouraged, but may be approved based on the justification provided in the application (see Field K. under 3.3.5 below).

3.3.4 R&R Senior Key Person – (PDF Format is Required)

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

Applicants must fill out a profile for the PD and anyone that will be supported by the budget. For instructions on completing the profile part of this form, applicants must reference the NIFA Application Guide for directions.

- (1) **Biographical Sketch (Vitae) – (PDF Format is Required)** – Identify key personnel of the small business concern, project consultants, and subcontractors and include information on their directly related education and experience, relevant publications, or a current copy of their vitae. 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 the most important and/or relevant publications in refereed journals during the past four (4) years, including those in press, must be included. 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.
- (2) **Current and Pending Support – (PDF Format is Required)** – A current and pending support list must be included for all PDs. **Please note that the project being proposed should be identified as pending in the Current and Pending Support form.** 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. The template that applicants must use for this information can be found at http://www.nifa.usda.gov/home/faq_apply.html#current.

If an identical application or one containing a significant amount of essentially equivalent work as the one submitted in response to this solicitation has been previously funded or is currently funded, pending or about to be submitted to another Federal agency or to USDA in a separate action, the applicant must provide the following information:

- a. Name and address of the agency(s) to which an application was submitted, or will be submitted, as well as from which an award is expected or has been received;
- b. Date of actual or anticipated application submission or date of award, as appropriate;
- c. Title of application or award, identifying number assigned by the agency involved and the date the application was submitted or the award was received;
- d. Applicable research topic area for each application submitted or award received; and
- e. Name and title of PD for each application submitted or award received.

3.3.5 R&R Personal Data

As noted in Part V, subsection 6. of the NIFA Grants.gov Application Guide, the submission of this information is voluntary and is not a precondition of award. If completing the information, **do not enter any data in the field requesting the social security number.**

3.3.6 R&R Budget

Information related to the questions on this form is dealt with in detail in Part V, subsection 7. of the NIFA Grants.gov Application Guide unless otherwise noted below. Applicants who plan to have a sub award (subcontract) will need to reference section 3.3.7 for directions.

A Research & Related Budget form must be completed for each year (or partial year) for which work is proposed under this program solicitation. **Applicants must include a budget request that is appropriate for this solicitation. All USDA SBIR Phase I grants have a cap of \$100,000.**

Fields A1-B. Section A&B, Budget Period 1 - Applicants must reference the NIFA Application Guide for directions.

Fields C1-C11. Equipment Description - Performing organizations are expected to have appropriate facilities, suitably furnished and equipped. However, funding for items of equipment may be requested provided that they are specifically identified with the dollar amount and adequately justified, see Field K (2) Budget Justification of the R&R Budget for specific requirements.

Field D1. Domestic Travel – Applicants must reference the NIFA Application Guide for directions.

Field D2. Foreign Travel Costs Funds Requested - Requests for foreign travel are discouraged, but may be approved based on the justification provided in the application. See Field K (2) Budget Justification of the R&R Budget for specific requirements.

Fields E 1-5. Participant/Trainee Support Costs - Applicants must reference the NIFA Application Guide for directions.

Fields F 1-10. Other Direct Costs - Applicants must reference the NIFA Application Guide for directions.

Field G. Direct Costs - Applicants must reference the NIFA Application Guide for directions.

Fields H 1-4. Indirect Costs - Applicants must reference the NIFA Application Guide for directions (see 3.3.5 Field K(7)).

Field I. Total Direct and Indirect Costs - Applicants must reference the NIFA Application Guide for directions. **If an applicant requests a fee, the combined total of “Section I - Total Direct and Indirect Costs” and “Section J – Fee” on the Research & Related (R&R) Budget form must not exceed the funding ceiling of this full announcement. Budget requests that exceed the funding ceiling of this full announcement will be excluded from review.**

Field J. Fee - Applicants must reference the NIFA Application Guide for directions. **If an applicant requests a fee, the combined total of “Section I - Total Direct and Indirect Costs” and “Section J – Fee” on the Research & Related (R&R) Budget form must not exceed the funding ceiling of this full announcement. Budget requests that exceed the funding ceiling of this full announcement will be excluded from review.**

Field K. Budget Justification – (PDF Format is Required) - A budget justification with supporting detail for each budget category as noted in items (1) through (5) of this subsection must be attached. **A**

budget justification is required for each entity for which a Research & Related Budget Form is submitted.

- (1) **Salaries and Wages** – Indicate the number and kind of personnel for whom salary support is sought, including job tasks. Provide the base salary for senior personnel. For key personnel, also indicate the number of work months of involvement to be supported with USDA funds, and explain how the level of compensation was established (e.g., the hourly rate of pay, the monthly rate of pay, or the yearly rate of pay).
- (2) **Equipment** – Performing organizations are expected to have appropriate facilities, be suitably furnished and equipped. However, funding for items of equipment may be requested, provided that they are specifically identified with the dollar amount and adequately justified. **Such requests should normally not exceed 10 percent of the budget.** Equipment is defined as an article of nonexpendable, tangible personal property having a useful life of more than one year and an acquisition cost of \$5000 or more per unit. Awardees are usually allowed to retain title to equipment purchased with funding provided under a SBIR funding agreement. However, in some instances, USDA may direct the awardee to vest title to a third party. **Awardees should plan to lease expensive equipment.** The inclusion of equipment will be carefully reviewed with respect to need and appropriateness for the research proposed.
- (3) **Materials and Supplies** – The types of expendable materials and supplies required should be indicated in general terms with estimated costs.
- (4) **Travel** – The type and extent of travel and its relationship to the project should be specified. Funds may be requested for field work or for travel to professional meetings. Requests for foreign travel are discouraged, but may be approved based on the justification provided in the application. In the budget justification, provide the purpose, the destination, method of travel, number of persons traveling, number of days, and estimated cost for each trip. If details of each trip are not known at the time of application submission, provide the basis for determining the amount requested.
- (5) **All Other Direct Costs** – Other anticipated direct costs not included above should be itemized. Examples include, but are not limited to, subcontracts and consultants. See Field 12 “Other Attachments” of the R&R Other Project Information form for required documentation associated with subcontracts and consultants. A budget and budget justification stating sub-contractual and consulting costs and the rationale for the amount of the costs are required. Consultants’ rate of pay normally cannot exceed \$590/day for an eight hour day. However, with proper documentation and justification, higher rates can be approved. Applicants should reference Section 1.4 (B) Size to determine the total amount of funds a Phase I SBIR project can provide to subcontracts and consultants.
- (6) **Fee** - A reasonable fee, not to exceed seven percent of total Federal funds awarded (.07527 of total Direct and Facilities and Administrative (F&A)/Indirect Costs) is permitted under this program solicitation, but applicants are encouraged to minimize fee requests due to the small amount of funds available. **All fees are subject to negotiation with USDA.** If a fee is requested, the amount should be indicated in Field J “Fee” on the R&R Budget form. **Applicants that are not familiar with the definition of a fee, should reference section 2.0 of this RFA.**
- (7) **Indirect Costs** - If available, the current rate negotiated with the cognizant Federal negotiating agency should be used. Indirect costs may not exceed the negotiated rate. If a negotiated rate is used, the percentage and base should be indicated in the space allotted in item H of the budget sheet. If no rate has been negotiated, applicants must show specific breakdown of rate being applied to this award

by using accurate accounting and real financial figures, which will be subject to approval by USDA. In the latter case, if an application is recommended for funding, an indirect cost rate proposal must be submitted to support the amount of indirect costs requested. NIFA will request an indirect cost rate proposal and provide instructions, as necessary. An applicant may elect not to charge indirect costs and, instead, use all grant funds for direct costs. If indirect costs are not charged, the phrase “None requested” should be written in this space. A billing rate may be established for this award only. (Note: Billing rates are not negotiated for subrecipients).

3.3.7 R&R Subaward Budget Attachment - (PDF Format is Required)

Information related to the questions on this form is dealt with in detail in Part V, subsection 8. of the NIFA Grants.gov Application Guide.

Applicants should note that the check application feature in the Grants.gov application package will not check the Subaward budget forms. However, once the application is submitted to Grants.gov, Grants.gov will validate the subaward budget forms for compliance. If the subaward budget forms fail the Grants.gov validation, the application will be rejected and an email will be sent to the applicant notifying them of this problem. USDA NIFA will not accept late applications due to a non-compliant subaward budget forms. As indicated on page 5 of this solicitation, applicants must plan ahead and submit early in order to correct any problems they may have with their submission to Grants.gov.

3.3.8 NIFA Supplemental Information

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

Field 2. Program to Which You Are Applying and Program Code – This refers to the topic area (see section 8.0) to which you are submitting your USDA SBIR application. For example:

Program Code Name
Forest and Related Resources
Program Code
8.1

If you have a question about which topic area is appropriate for your application, please contact the National Program Leader in the area(s) in question. An application can only be submitted to one topic area. It is extremely important the Program Code Name and Program Code are spelled correctly and match exactly one of the topic areas indicated in section 8.0 of the program solicitation. Failure to complete these fields correctly could significantly delay the acceptance of your application into the program and the application may not be reviewed.

Field 8. Conflict of Interest List – A conflict of interest attachment is not necessary for USDA SBIR applications. No attachments should be added.

3.3.9 SBIR/Small Business Technology Transfer Program (STTR) Information

Information related to the questions on this form is dealt with in detail in Part VI, subsection 3. of the NIFA Grants.gov Application Guide unless otherwise noted below.

Field 1b. Anticipated Number of Personnel to be employed at your organization at the time of award? – Enter a number.

Field 7. Commercialization Plan – Leave this section blank.

Field 8. Documentation of Prior SBIR Phase I Awards – A small business firm that submits a Phase I application and has received more than 15 Phase II SBIR awards during the preceding five fiscal years must document the extent to which it was able to secure Phase III funding to develop concepts resulting from previous Phase II SBIR awards. In addition, the documentation must include the name of the awarding agency, date of award, funding agreement number, amount, topic or subtopic title, follow-on agreement amount, source and date of commitment, and current commercialization status for each Phase II award. USDA shall collect and retain the information at least until the General Accounting Office submits the report required under section 105 of the Small Business Research and Development Enhancement Act of 1992.

If the applicant falls under the threshold as indicated above, provide an attachment stating that per the program solicitation guidelines, less than 15 Phase II awards have been granted to this organization/company during the preceding five fiscal years.

4.0 METHOD OF SELECTION AND EVALUATION CRITERIA

4.1 Introduction

All Phase I applications will be evaluated on a competitive basis. Applications will be initially screened to determine responsiveness to the program solicitation. Applications passing this initial screening will be evaluated by technical reviewers to select those with the highest scientific and technical merit. **Applications received after the specified closing date or not following application guidelines of this program solicitation will not be considered for a Phase I SBIR award and will not be reviewed.**

External peer reviewers will be used during the technical evaluation stage of this process. Selections will be made from among recognized specialists who are uniquely qualified by training and experience in their respective fields to render expert advice on the merit of applications received. It is anticipated that these experts normally will be drawn from universities, Government, and non-profit research organizations. If possible, USDA intends that peer review groups shall be balanced with minority and female representation and with an equitable age distribution.

Final decisions will be made by USDA based upon the ratings assigned by reviewers and consideration of other factors, **including the potential commercial application**, possible duplication of other research, any critical USDA requirements, program balance, and budget limitations. There is no commitment by USDA to fund any particular application, to support any specific number of applications in a given research topic area, or to make a specific number of awards. USDA also may elect to fund several or none of the proposed approaches to the same topic. Care will be taken to avoid actual and potential conflicts of interest among reviewers. Evaluations will be confidential to USDA staff members, peer reviewers, and the proposed Project Director to the extent permitted by law.

4.2 Initial Screening Criteria

To avoid misunderstanding, applicants should be aware that applications not satisfying all of the screening criteria are at risk of being excluded from NIFA review. Returned applications may not be resubmitted (with or without revision) under this solicitation. The initial screening criteria are the following:

- (A) The proposing firm must qualify as a small business concern as defined in section 2.0.
- (B) The application must be submitted by the published due date as described in section 6.0.
- (C) The application must meet the Application Content and Format requirements as described in section 3.0.
- (D) Applications must be limited to one research problem as described in section 3.0.
- (E) The proposed budget must be within the dollar limit identified in subsection 1.2 and section 3.3.6.
- (F) The proposed Phase I research must fall within a solicited topic area. See section 8.0 for the listing of topic area descriptions.
- (G) An application must contain adequate scientific/technical information clearly stating the research plan and objectives. USDA reserves the right not to submit for review any application that it finds to have insufficient scientific/technical information.

- (H) A resubmitted application must address concerns of the previous review panel. USDA reserves the right not to submit for review any application found not to be responsive to the previous review.

4.3 Phase I Evaluation Criteria

USDA plans to select for award those applications offering the best value to the nation. The primary evaluation criteria used by reviewers are listed below. Approximately equal consideration will be given to each criterion, **except for item (A) which will receive twice the value of any of the other items.**

(A) Scientific and Technical Feasibility:

- The application should contain a thorough background section with an up-to-date literature review.
- The application should clearly state the objectives logically and indicate how they will lead toward proving the technical feasibility of the approach or concept.
- The research plan should offer an original and innovative approach to the problem and sufficient detail to indicate how each research objective will be investigated.
- The research plan should be completed in the requested grant period.

(B) Importance of the Problem:

- The application should provide sufficient justification for the importance of the problem and clearly indicate the anticipated commercial potential of the proposed research.
- The proposed project should be in the public interest and satisfy one or more of the USDA strategic goals and objectives listed in subsection 3.3.3 (item 10 of Field 8).

(C) Investigator and Resource Qualifications:

- The bibliographic information should be provided to document that the Project Director, other key staff and any consultants have the appropriate training and experience to carry out the proposed research plan.
- If consultants, subcontractors or CRADA cooperators are involved in the project, letters from these individuals should be included in the application verifying their willingness to participate in the research study, their rates of pay and any other budgetary information.
- Adequate research facilities that are available should be owned or controlled by the small business for the duration of the grant.
- Instrumentation available should be adequate to complete the proposed research plan.

(D) Budget:

- The budget should be appropriate for the proposed research plan.
- Budget detail should include subcontract, consultant, and CRADA data to indicate clearly how the funds would be utilized.

(E) Duplication:

- Duplication of any ongoing or previous research by the small business firm or by other researchers will not be considered.
- The application should clearly indicate how the proposed technology would differ significantly from existing technology.
- If the small business firm or a consultant has received or applied for patent(s) pertaining to the proposed technology, the proposed research should constitute a legitimate feasibility study.

Additional factors that will be considered in the review process include whether an application involves a CRADA with a USDA laboratory or is a resubmission. In the event that two or more applications are of

approximately equal merit, the existence of a CRADA with a USDA laboratory will be an important consideration. If one application is a resubmission, this will also be an important consideration.

4.4 Phase I Review Process

USDA evaluates applications using a confidential peer review. Separate review panels are held that correspond to each of the topic areas listed in Section 8.0. Reviewers are normally drawn from universities, government and non-profit research organizations. For each topic area, a leading research scientist is appointed as a topic manager. In consultation with the SBIR program staff, this individual appoints a review panel. The review panel meets in Washington, DC to evaluate all applications. Applications are reviewed both by members of the review panel and by ad hoc reviewers with specific expertise appropriate for each application. The panel discusses each application carefully and then ranks the applications. The panel rankings are used in determining which applications are funded.

Considerable effort is made to ensure that the review process is confidential. Reviewers are instructed to handle all applications in complete confidence and each reviewer is provided written guidelines to follow. All reviewers are obligated to certify that they will maintain confidentiality at the time they prepare a review and submit it through the Agency's electronic Peer Review System.

Every effort is made to avoid even the appearance of a conflict-of-interest (COI). The USDA has very detailed rules on COI that are followed during the review process. If a panel member has a COI on an application, he/she will not review the application and will be excused from the panel meeting while the particular application is being discussed. USDA is committed to ensuring the review process is fair and is handled with confidentiality.

4.5 Notice to Applicants

Technical reviewers will base their conclusions and recommendations on information contained in the application. It cannot be assumed that reviewers are acquainted with any experiments referred to within an application, with key individuals, or with the small business firm itself.

After final decisions have been announced, a panel summary that briefly states the main strengths and weaknesses of the application and the written reviews of the application will be sent to the PD . The reviews will not include the scores nor the identities of the reviewers. Due to funding limitations and USDA's desire to support as many worthwhile projects as possible, it may be necessary for USDA to reduce the amount of an award below the amount requested by a small business or to fund only certain objectives outlined in the application. Any significant changes will be discussed with the proposing firm, which may then be asked to submit a revised budget reflecting the reduced amount. In the event that this occurs, specific instructions will be provided to the applicant.

5.0 CONSIDERATIONS

5.1 Awards

Depending upon the availability of funds, USDA expects to make approximately 85 Phase I awards not to exceed \$100,000 each to small businesses in FY 2012. Awards are anticipated to be made on or about May 1, 2012. USDA will announce the names of those concerns receiving awards and successful applicants will then typically have eight months after awards are made to carry out their proposed Phase I effort.

All Phase I awards will be issued as research grants in accordance with the guidelines contained in 31 U.S.C. 6301-6308, the authority contained in Section 630 of the Act making appropriations for Agriculture, Rural Development and Related Agencies' programs for fiscal year ending September 30, 1987 and for other purposes, as made applicable by Section 101(a) of Public Law Number 99-591, 100 Stat. 3341.

A reasonable fee, not to exceed seven percent of total Federal funds awarded (.07527 of total direct and F&A/indirect costs) is permitted under this program solicitation, but applicants are encouraged to minimize fee requests due to the small amount of funds available. All fees are subject to negotiation with USDA. If a fee is requested, the amount should be indicated in Field J. Research and Related Budget.

5.2 Reports

Because these reports are made available to the public, proprietary information should not be included in these reports.

5.2.1 Technical Reports

For successful Phase I applications, the grantee is required to submit the following technical reports in accordance with the terms and conditions of the award.

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

These reports should be submitted electronically as an attachment (MS Word or PDF) to the following email address: sbir@nifa.usda.gov. **Reporting instructions will be found in the Terms and Conditions which will be provided at the time of award.** Additional guidance for these reports can be found on the "Grantee Resources" webpage located at <http://www.nifa.usda.gov/funding/sbir/sbir.html>.

Please note: All technical reports are held confidential for a period covering four years after the termination of the project. **As such, proprietary information should be included in all technical reports only when necessary to provide the USDA SBIR Staff adequate information to evaluate the outcome of the project.**

5.2.2 Financial Reports

For Phase I applications, a final “**Financial Status Report**” (SF-425) is due within 90 days after the expiration date of the grant (www.whitehouse.gov/omb/grants/sf269a.pdf) and should be submitted as a PDF to the Awards Management Division, Office of Grants and Financial Management at awards@nifa.usda.gov, in accordance with instructions contained in Section 3015.82 of the Uniform Federal Assistance Regulations.

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

5.3 Payment Schedules

Payments will be made by electronic funds transfer through the Department of Treasury’s Financial Management Service ASAP System. All questions relating to payments should be submitted to:

Financial Operation Division
Office of Grants and Financial Management
National Institute of Food and Agriculture
U. S. Department of Agriculture
STOP 2298
1400 Independence Avenue, SW
Washington, DC 20250-2298
Telephone: (202) 401-4527
Facsimile: (202) 401-3481

Successful Phase I applicants can anticipate a payment schedule in accordance with the terms and conditions of the award.

If the awardee is a sole proprietorship, funds awarded shall be deposited in a separate bank account and NIFA, through the ADO, shall be informed of the name and location of the bank. In addition, arrangements must be reached between the awardee and the bank of deposit of the award funds in accordance with the following:

1. The account must be of a nature that permits the bank of deposit to return unused funds remaining in that account to NIFA in the event of the awardee’s demise. However, NIFA shall not be named a joint owner of such an account, but rather as beneficiary.
2. These arrangements must also be reported to NIFA through the ADO.

5.4 Proprietary Information

Information contained in unsuccessful applications will remain the property of the applicant. The Government may, however, retain copies of all applications. Public release of information in any application submitted will be subject to existing statutory and regulatory requirements. If proprietary information is provided by an applicant in an application, which constitutes a trade secret, proprietary commercial or financial information, confidential personal information or data affecting the national security, it will be treated in confidence, to the extent permitted by law. This information must be clearly

marked by the applicant with the term “confidential proprietary information,” and the following legend must appear on each PDF attachment submitted as a part of the application: “These data shall not be disclosed outside the Government and shall not be duplicated, used or disclosed in whole or in part for any purpose other than evaluation of this application. If a funding agreement is awarded to this applicant as a result of or in connection with the submission of these data, the Government shall have the right to duplicate, use or disclose the data to the extent provided in the funding agreement and pursuant to applicable law. This restriction does not limit the Government’s right to use information contained in the data if it is obtained from another source without restriction. The data subject to this restriction are contained on pages ___ of this application.”

Any other legend may be unacceptable to the Government and may constitute grounds for removing the application from further consideration without assuming any liability for inadvertent disclosure. The Government will limit dissemination of such information to within official channels.

USDA, by law, is required to make the final decision as to whether the information is required to be kept in confidence. Information contained in unsuccessful applications will remain the property of the applicant. However, USDA will retain for three years one file copy of all applications received; extra copies will be destroyed. Public release of information for any application submitted will be subject to existing statutory and regulatory requirements. The legislation reauthorizing the SBIR program strengthened the protection of awardee firms relative to maintaining confidentiality of proprietary information for a period of four years after the end of the grant period. However, any application which is funded will be considered an integral part of the award and normally will be made available to the public upon request through the Freedom of Information Act, except for designated proprietary information.

The inclusion of proprietary information is discouraged unless it is necessary for the proper evaluation of the application. If proprietary information is to be included, it should be limited, set apart from other text on a separate page, and keyed to the text by numbers. It should be confined to a few critical technical items which, if disclosed, could jeopardize the obtaining of foreign or domestic patents. Trade secrets, salaries, or other information that could jeopardize commercial competitiveness should be similarly keyed and presented on a separate page. Applications or reports that attempt to restrict dissemination of large amounts of information may be found unacceptable by USDA.

5.5 Rights in Technical Data

Rights in technical data, including software developed under the terms of any funding agreement resulting from an application submitted in response to this solicitation, shall remain with the grantee. However, the Government shall have the limited right to use such data for Governmental purposes and shall not release such data outside the Government without permission of the grantee for a period of four years from completion of the project under which the data were generated. Effective at the conclusion of the four-year period, the Government shall retain a royalty-free license for Governmental use of any technical data delivered under the agreement, whether patented or not.

5.6 Copyrights

With prior written permission of the ADO, the grantee normally may copyright and publish (consistent with appropriate national security considerations, if any) material developed with USDA SBIR support. USDA receives a royalty-free license for the Federal Government and requires that each publication contain the following acknowledgment and disclaimer statement:

“The project was supported by the Small Business Innovation Research program of the U.S. Department of Agriculture, grant number #. Any opinions, findings and conclusions or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of the U.S. Department of Agriculture.”

The last sentence may be omitted from articles published in scientific journals.

5.7 Patents and Inventions

Allocation of rights to inventions shall be in accordance with 35 U.S.C. 202-206 and the Department of Commerce implementing regulations entitled “Rights to Inventions Made by Nonprofit Organizations and Small Business Firms under Government Grants, Contracts and Cooperative Agreements” at 37 CFR Part 401. These regulations provide that small businesses normally may retain the principal worldwide patent rights to any invention developed with USDA support. USDA receives a royalty-free license for Federal Government use, reserves the right to require the patentee to license others in certain circumstances, and requires that anyone exclusively licensed to sell the invention in the United States must normally manufacture it domestically. To the extent authorized by 35 U.S.C. 205, USDA will not make public any information disclosing a USDA-supported invention for a four-year period to allow the grantee a reasonable time to file an initial patent application. Additional information may be obtained by contacting:

Interim Director, Planning, Accountability, and Report Staff National Institute of Food and Agriculture,
USDA
STOP 2213
1400 Independence Avenue, SW
Washington, DC 20250-2213
Telephone: (202) 720-5623
Facsimile: (202) 720-7714

SBIR awardees must report inventions to the awarding agency within two months of the inventor’s report to the awardee. The reporting of inventions must be made through submission to Interagency Edison (www.iedison.gov). Specific instructions for invention reporting are contained in the agency’s terms and conditions, a copy of which can be provided upon request.

5.8 Research Involving Special Considerations

A number of situations frequently encountered in the conduct of scientific research require the submission of special information for a particular project. Since some types of research targeted for SBIR support have high probability of involving human subjects at risk or vertebrate animals, special instructions follow:

If the proposed research will involve human subjects at risk or vertebrate animals, the application must so indicate by checking “Yes” on the R&R Other Project Information form. Further, in the event that the project is funded, the applicant may be required to have the research plan reviewed and approved by the appropriate review board or committee. It is suggested that applicants contact local universities, colleges, or nonprofit research organizations that have established such reviewing mechanisms to have this service performed.

Guidelines to be applied and observed when conducting such research are outlined below.

- (A) **Human Subjects at Risk** - Regulations issued by the Department of Agriculture to be used in safeguarding the rights and welfare of human subjects used in research supported with USDA grant funds are contained in 45 CFR Part 46 and USDA regulations set forth in 7 CFR part 1c. All nonexempt research projects involving human subjects must be approved by an Institutional Review Board prior to commencing actual substantive work.
- (B) **Animal Care** - The performing organization must comply with the Animal Welfare Act (7 U.S.C., 2131-2156); Public Law 89-544, 1996 and the regulations issued by the Department of Agriculture in 9 CFR parts 1, 2, 3 and 4. In the case of domesticated farm animals housed under farm conditions, the grantee must adhere to the principles stated in the Guide for the Care and Use of Agricultural Animals in Agricultural Research and Teaching, and Federation of Animal Sciences Societies, 1999. In the event a project involving the use of living vertebrate animals results in a grant award, funds will be released only after a qualified Institutional Animal Care and Use Committee has approved the project.

5.9 Grantee Commitments

Upon issuance of a research grant by USDA, the awardee will be required to make certain legal commitments through acceptance of the award document and the terms and conditions attached thereto, as well as any project-specific terms or conditions outlined. Most of these terms and conditions are contained in USDA's Uniform Federal Assistance Regulations, 7 CFR Part 3015, which will be incorporated into all Phase I awards resulting from this program solicitation. These regulations primarily consolidate internal policies and procedures relating to USDA's assistance programs and implement various Federally issued assistance policies, including applicable Federal cost principles and uniform administrative requirements. Copies are available at: www.access.gpo.gov/nara/cfr/waisidx_04/7cfr3015_04.html.

5.10 Additional Information

- (A) This program solicitation is intended for informational purposes and reflects current planning. If there is any inconsistency between the information contained herein and the terms of any resulting SBIR funding agreement, the terms of the funding agreement are controlling.
- (B) Before the award of an SBIR funding agreement, USDA requires the submission of certain organizational management, personnel, and financial information to assure responsibility of the applicant, including certification that the proposing organization is in compliance with the Civil Rights Act of 1964. These forms will be provided to the small business concern by the Office of Extramural Programs, NIFA, prior to the forwarding of the funding agreement for acceptance. The information contained in both forms must normally be submitted on a one-time basis only. (If sufficient changes occur within the organization to warrant submission of new or additional information, additional forms should be requested by calling either (202) 401-4986) It is anticipated that all Phase I awardees will be required to submit the above information. **Please note that NIFA will not issue an award until all requested organizational management and financial information has been received. Delaying or failing to submit this information could result in the application not being funded.**
- (C) If an applicant or a grantee is contemplating any type of transaction involving the entity (i.e., merger, spin-off or sale), it is advised that the applicant or the grantee contact one of the SBIR NPLs (see subsection 1.5) for knowledge of how the transaction may affect a potential grant or existing grant, as applicable.

- (D) USDA is not responsible for any monies expended by the applicant prior to the award of any funding agreement.
- (E) This program solicitation is not an offer by USDA and does not obligate USDA to make any specific number of awards. Also, awards under this program are contingent upon the availability of funds.
- (F) Unsolicited applications will not be accepted under the SBIR program.
- (G) The applicant must provide the total number of employees for the organization and its subsidiaries and/or parent company, if applicable.

6.0 SUBMISSION OF APPLICATIONS

6.1 When to Submit

All Phase I applications must be submitted via Grants.gov by **5:00 p.m. Eastern Time on September 1, 2011**. Applications received after this deadline normally will not be considered for funding.

For the convenience of all potential applicants, the following schedule is provided for informational purposes:

Phase I

Deadline date for applications..... September 1, 2011

Normal period of research performance.....May 1, 2012 through December 31, 2012

6.2 What to Submit

USDA SBIR electronic application submissions consist of forms (viewed, completed, and submitted through the Grants.gov Web site) and attachments. All of the necessary forms and instructions will be found on the Grants.gov Web site and in section 3.0 of this program solicitation. One way applicants can access the appropriate page on Grants.gov is by visiting the USDA SBIR funding opportunity page at <http://www.nifa.usda.gov/fo/sbir>. Clicking on the Funding Opportunity Number listed near the bottom of the page will link the applicant directly to the information and forms necessary to submit through Grants.gov.

All attachments submitted with the application must be in PDF.

ANY PROPOSALS CONTAINING NON-PDF DOCUMENTS WILL BE AT RISK OF BEING EXCLUDED FROM NIFA REVIEW. Partial applications will be excluded from NIFA review.

Please note: Applicants must have successfully completed the entire registration process, see subsection 3.2.2, prior to being able to submit an application through Grants.gov.

6.3 Where to Submit

All FY 2012 applications submitted to USDA SBIR must be submitted electronically through Grants.gov.

6.4 Questions Pertaining to the USDA SBIR Program or to this Solicitation

Written or verbal questions of a general nature about the USDA SBIR program, as well as general questions pertaining to this solicitation, but not pertaining to requests for additional copies of the solicitation, should be sent to sbir@nifa.usda.gov or can be directed to one of the USDA SBIR NPLs, see section 1.5.

6.5 Information on Application Status

It is anticipated that the evaluation of Phase I applications will require approximately six months from September 1, 2011, and no information on application status will be available until final selections have been made. Both successful and unsuccessful applicants will be notified of final award decisions within approximately six months.

7.0 SCIENTIFIC AND TECHNICAL INFORMATION SOURCES

Listed below are some of the sources that can provide technology search and document services which may be useful in preparing SBIR applications. They can be contacted directly for service and cost information.

National Agricultural Library
Service Desk
U.S. Department of Agriculture
10301 Baltimore Avenue
Beltsville, MD 20705-2351
(301) 504-5755
www.nal.usda.gov

National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
(800) 553-6847
www.ntis.gov

National Technology Transfer Center
Wheeling Jesuit University
316 Washington Avenue
Wheeling, WV 26003
(304) 243-2455 or (800) 678-6882
www.nttc.edu

REEport USDA/NIFA/OIT
1400 Independence Ave., SW
Stop 2270
Washington, DC 20250
http://www.nifa.usda.gov/business/reeport_imp.html

Regional Technology Transfer Centers

Far West
Western Research Application Center
(WESRAC)
3716 South Hope Street, Suite 200
Los Angeles, CA 90007
(213) 743-2732
<http://wesrac.usc.edu/>

(757) 766-9200
Fax (757) 766-2402
www.teccenter.org

Mid-Continent Technology Transfer Center
Texas Engineering Extension Service
The Texas A&M University System
301 Tarrow
College Station, TX 77843-8000
(979) 845-8762
Fax (979) 845-3559
www.teex.com

Northeast
Center for Technology Commercialization
1400 Computer Drive
Westborough, MA 01581-5043
(508) 870-0042
www.ctc.org

Mid-Atlantic
TECC - the Technology Commercialization
Center
144 Research Drive
Hampton, VA 23666

Southeast
Georgia Institute of Technology
151 6th Street
216 O'Keefe Building
Atlanta, GA 30332
(404) 894-6786
www.edi.gatech.edu/nasa

8.0 RESEARCH TOPIC DESCRIPTIONS AND INSTRUCTIONS

Applicants are encouraged to submit applications that address the research priorities stated for each topic area described in this Program Solicitation (see topic areas 8.1 through 8.13 below). Applicants are also encouraged to submit applications related to agriculturally-related manufacturing technology, energy efficiency and alternative and renewable energy or one or more of the NIFA Societal Challenge Areas; see page 9. Applicants should pay attention to specific instructions located within each of the topic area descriptions when developing their application. Each topic area description provides background information, FY 2012 research priorities and other key information. Applicants should apply to the most appropriate topic area. However, USDA reserves the right to shift applications between topic areas when necessary for most effective review. Applicants that have questions regarding topic areas should contact the listed NPL.

8.1 Forests and Related Resources

Investigators are encouraged to contact Dr. Charles Cleland, National Program Leader for SBIR Forests and Related Resources at ccleland@nifa.usda.gov or (202) 401-6852 regarding questions about the suitability of research topics or to arrange a telephone consultation.

Background

The Forests and Related Resources topic area aims to address the health, diversity and productivity of the Nation's forests and grasslands to meet the needs of present and future generations through the development of environmentally sound approaches to increase productivity of forest lands and develop value-added materials derived from woody resources. New technologies are needed to enhance the protection of the Nation's forested lands and forest resources and help to ensure the continued existence of healthy and productive forest ecosystems. Proposals focused on sustainable bioenergy and development of value-added biofuels from woody biomass, and on the influence of climate change on forest health and productivity are strongly encouraged. Proposals are also encouraged that utilize nanotechnology in their approach to developing new wood-based products or that utilize wood-based nano-materials are encouraged.

To meet the identified needs in forestry and wood utilization, the program's long-term goals (10 years) are to achieve increased utilization of woody resources for value-added products from wood; healthy and sustainable forest ecosystems with reduced impact from wildfires; healthier forest ecosystems where the impact of pathogens and insects can be minimized; sustainable harvesting of woody resources with reduced ecological impact; and improved growth and yield of major forest species that will lead to more efficient use of forested lands.

FY 2012 Research Priorities:

Examples of appropriate subtopics for research applications from small businesses include, but are not limited to the following:

1. **Growth and Yield** – Improving growing stock, tissue culture, genetic manipulation or vegetative reproduction of forest trees, and other means of increasing the regenerative abilities of forests; developing systems to increase the survival of newly planted trees through mechanical, physical or chemical means that are environmentally safe; reducing the adverse impact of pathogens and insects by developing better methods to monitor infestations and improved control strategies for combating insects and pathogens that attack important woody species.
2. **Increasing the Utility of Forest-Grown Material** – Research to improve lumber yield or other means of increasing the volume and worth of wood from individual trees; utilizing a greater percentage of the tree through improved or new techniques of veneering or comminution, for the production of new or improved reconstituted products; developing better methods for manufacturing wood products and testing wood products for performance and durability; and developing improved methods for the production of paper.
3. **Reducing Ecological Damage by Forest Operations** – Research to reduce soil erosion, compaction or other alterations caused by harvesting and/or other forest operations, and provide for the economic recovery of resources from forests while raising potential productivity and reducing impacts to the ecological structure of the area of operation.

4. **Urban forestry** – Research to promote the growth of forested land in urban areas, to address problems of forest fragmentation, the introduction of invasive species, and the impact of urban forested land on air and water quality.
5. **Climate Change** – Research to address the issue of ecosystem adaptation to climate change, ways to enhance carbon sequestration, development of decision support tools for forest managers and markets for forest ecosystem services.
6. **Developing Technology that Facilitates the Control of Wildfires on Forest Lands** – Research that provides systems for detecting and managing wildfires; systems for reducing fuel loads in forests; tools and equipment for improving the efficacy and safety of fire fighters on the ground and in the air; and communication and navigation systems for improving the coordination of fire management activities.
7. **Sustainable Bioenergy and Development of Value-Added Products From Forest Resources** – Research for development of improved methods for the conversion of forest biomass into ethanol, other biofuels and specialty chemicals, and development of new wood-based composite materials.

Other Key Information

- **ALL ATTACHMENTS MUST BE SUBMITTED IN THE PORTABLE DOCUMENT FORMAT (PDF).**
- All Phase I applications should give the reviewing community a brief vision of where the PD expects the project to be at the end of Phase II (entering Phase III commercialization).
- Applications exceeding the budget limitation or exceeding the page limit or not meeting the formatting requirements will be excluded from NIFA review.
- The applicants are strongly encouraged to contact the National Program Leader regarding the suitability of research topics.
- Applications that deal with the development of biofuels derived from non-woody agricultural crops should be submitted under topic area 8.8 Biofuels and Biobased Products.

8.2 Plant Production and Protection - Biology

Investigators are encouraged to contact Dr. William Goldner, National Program Leader for SBIR Plant Production and Protection - Biology at wgoldner@nifa.usda.gov regarding questions about the suitability of research topics or to arrange a telephone consultation (202) 401-1719.

Background

The objective of this topic area is to examine means of enhancing crop production by applying biological approaches to reduce the impact of harmful agents, develop new methods for plant improvement, and apply traditional plant breeding methods and new technologies to develop new food and non-food crop plants, as well as new genotypes of existing crop plants with characteristics that allow their use in new commercial applications. This topic area supports the following NIFA Societal Challenge Areas: Global Food Security and Hunger; Climate Change; Sustainable bioenergy; and Food Safety. Examples of appropriate subtopics for research applications from small businesses include, but are not limited to the following:

- **Plant improvement** – Improved efficiency of crop production by adoption and/or development of innovative methods and applications for traditional plant breeding and biotechnology, including but not limited to, molecular biology, and mutagenesis; genomics; tissue culture; and embryogenesis to produce crops with new or improved quality, yield and agronomic, horticultural, value-added, or economic traits.
- **New crops** – Development of new crop plants as sources of food, non-food industrial, or ornamental products.
- **Plant protection** – Reduced the impact of plant pathogens, insect pests, and abiotic stress on crop plants; and increasing plant resistance to plant pathogens, insect pests, and abiotic stress.

FY 2012 Research Priorities: SBIR is **strongly encouraging** the submission of applications focusing on the following problem areas. Additional consideration will be given to applications addressing the development of products, process, and services for U.S. production of specialty crops (fruits, nuts, vegetables, nursery, and greenhouse crops) and agronomic bioenergy feedstock crops (Note: proposals addressing the major commodity crops will also be accepted and reviewed):

1. Projects that address the health and success of domesticated and natural pollinators of economically important crops.
2. Improved plant disease diagnostics (accurate, rapid, and cost-effective identification of causal agents in specialty crop plants at the earliest possible time relative to manifestation of disease).
3. Biological approaches to protect organically-grown crops from insect and nematode pests and diseases.
4. Biological approaches to improving commercial floricultural production (technology to improve the competitiveness of U.S. production of flowering potted plants, bedding plants, seasonal crops, annuals, perennials, and cut flowers).
5. Biological approaches to improve dedicated bioenergy feedstock crops (excluding woody biomass crops and algae, see Other Key Information below).

6. Systems, methods, or technologies that facilitate the movement (deregulation) of transgenic specialty crops through the existing regulatory system to reach consumer markets. Applications should not address issues surrounding consumer acceptance of transgenic crops and their products.

Other Key Information

- **ALL ATTACHMENTS MUST BE SUBMITTED IN THE PORTABLE DOCUMENT FORMAT (PDF).**
- All Phase I applications should give the reviewing community a brief vision of where the PD expects the project to be at the end of Phase II (entering Phase III commercialization).
- Phase I applications involving the development of transgenic crops would benefit by the inclusion of a brief description of the proposed path to commercialization, including an understanding of what will be needed to clear regulatory consideration. Phase II applications involving the development of transgenic crops should have an expanded section on how regulatory considerations will be met and market entry attained.
- Applications that deal with non-biological engineering technologies should be sent to topic area 8.13 Plant Production and Protection – Engineering.
- Applications that deal with the genetic improvement and production of woody biomass feedstock crops should be submitted to the 8.1 Forest and Related Resources topic area.
- Applications that deal with the genetic improvement and production of algae should be submitted to the 8.7 Aquaculture topic area.
- Applications exceeding the budget limitation or exceeding the page limit or not meeting the formatting requirements will be excluded from NIFA review.

8.3 Animal Production and Protection

Investigators are encouraged to contact Dr. Adele Turzillo, National Program Leader for Animal Production Systems at aturzillo@nifa.usda.gov regarding questions about the suitability of research topics or to arrange a telephone consultation (202) 401-6158.

Background

The Food and Agriculture Organization (FAO) of the United Nations predicts that feeding the world's growing population will require a doubling of global food production by 2050. Fulfilling this need will require new technologies to improve both productivity and efficiency of food animals. The Animal Production and Protection topic area aims to develop innovative, marketable technologies that will provide significant benefit to the production and protection of agricultural animals. New technologies for rapid detection, treatment and prevention of disease are needed to improve productivity and enhance the biosecurity of our herds and flocks. Better technologies are also needed to trace animals as they move through the food supply chain and to ensure that food products derived from animals do not contribute to food-borne illnesses. To meet increasing consumer demand for value-added animal products, innovative technologies are needed to address the challenges presented by non-conventional management systems and strategies. And there is an urgent need for technologies that decrease the impact of animal agriculture on the environment and optimize use of our natural resources. Technological advances in animal production and protection will not only enhance the safety of the Nation's food supply and contribute to environmental stewardship, they will also allow American producers to remain competitive in the global marketplace and contribute to global food security.

FY 2012 Research Priorities:

Development of marketable technologies designed for use in agriculturally important animals that will:

1. Improve production efficiency. Areas of interest include improved fertility; increased feed efficiency; and translation of genomic information into practical use and benefit.
2. Improve the safety and/or quality of end products derived from animals. These technologies must be applicable in the pre-harvest environment.
3. Improve animal health and well-being. Examples of these technologies include new diagnostics, therapeutics, vaccines and other immunization methods, biosecurity management tools, traceability methods, and animal handling methods.
4. Improve the productivity of animals in modified conventional or alternative animal production systems. Examples include non-confinement housing, pasture-based feeding systems, and organic systems.
5. Mitigate the impacts of animal agriculture on the natural environment. Areas of interest include technologies that decrease greenhouse gas emissions or reduce the excretion of phosphorus and nitrogen.

Other Key Information

- Applications not meeting one of the above research priorities will not be reviewed.

- Applications that deal with post-harvest technologies for products derived from animals will not be accepted for review under this program area. Applications that deal with post-harvest technologies for foods derived from animals may be submitted under topic area 8.5 Food Science and Nutrition.
- Applications should explain how the proposed work will contribute to the USDA Societal Challenge Areas (Global Food Security and Hunger, Climate Change, Food Safety).
- **ALL ATTACHMENTS MUST BE SUBMITTED IN THE PORTABLE DOCUMENT FORMAT (PDF).**
- Applications exceeding the budget limitation or exceeding the page limit or not meeting the formatting requirements will be excluded from NIFA review.
- The applicants are strongly encouraged to contact the National Program Leader regarding the suitability of research topics.
- All Phase I applications should give the reviewers a brief vision of where the PD expects the project to be at the end of Phase II (entering Phase III commercialization).
- Applications dealing with aquacultured species should be submitted under topic area 8.7 Aquaculture.

8.4 Air, Water and Soils

Investigators are encouraged to contact Dr. Charles Cleland, National Program Leader for SBIR Air, Water and Soils at ccleland@nifa.usda.gov regarding questions about the suitability of research topics or to arrange a telephone consultation (202) 401-6852.

Background

The Air, Water and Soils topic area aims to develop technologies for conserving and protecting air, water and soil resources while sustaining optimal farm and forest productivity. Climate change and food security are major focal points of this topic area. Efforts are needed to reduce the production of greenhouse gases that result from agricultural activities and to increase carbon sequestration in soils. Climate change is likely to alter temperature and precipitation patterns and new technologies are needed that will better enable plant and animal production systems to adapt to changing climatic conditions. As population continues to increase food security will be critical as efforts for food production to keep pace will increasingly become a challenge. Soil and water are critical resources that impact food production. New technologies are needed that will improve water quality and conservation and use water more efficiently. We also need new technologies that will improve soil quality and fertility and reduce soil erosion.

To meet these identified needs of agriculture, the program's long-term goals (10 years) are to achieve improved air quality and improved utilization of water resources that are better able to sustain production agriculture; better use of limited water resources for agriculture through improved irrigation technologies; a more sustained soil resource through reduced soil erosion and thereby lead to more productive agriculture; and improved soil quality that will permit a more sustainable and productive agriculture.

FY 2012 Research Priorities:

Examples of appropriate subtopics for research applications from small businesses include, but are not limited to, the following:

1. **Water Quality and Conservation** – Develop new and improved technologies to optimize water management conservation at both the farm level and at a watershed scale, monitor the quality of surface water and groundwater resources for biotic and abiotic pollutants, including animal manure and pharmaceuticals, develop improved methods for the reuse of waste water, including the remediation and restoration of water resources that impact agriculture and forestry operations, and promote watershed restoration.
2. **Irrigation** – Develop improved irrigation technologies for both farming and landscaping applications that will provide more efficient and cost-effective delivery of water and chemicals. Develop new irrigation methods that allow for more efficient use of water including accurate delivery of water to where it is needed.
3. **Soil Erosion** – Develop better methods for preventing soil erosion by wind and surface water runoff and for monitoring wind erosion and sediment transport.
4. **Soil Quality** – Develop new technologies for measuring soil properties, soil nutrient content, and the physical and chemical nature of soil. Research new technologies that enhance soil properties while restricting adverse environmental impact and develop improved methods to remediate degraded soils.

5. **Air Resources** – Develop new and improved technologies to monitor air quality and reduce air pollution stemming from agricultural enterprises, including manures from livestock and poultry production systems.

Other Key Information

- **ALL ATTACHMENTS MUST BE SUBMITTED IN THE PORTABLE DOCUMENT FORMAT (PDF).**
- All Phase I applications should give the reviewing community a brief vision of where the PD expects the project to be at the end of Phase II (entering Phase III commercialization).
- Applications exceeding the budget limitation or exceeding the page limit or not meeting the formatting requirements will be excluded from NIFA review.
- The applicants are strongly encouraged to contact the National Program Leader regarding the suitability of research topics.

8.5 Food Science and Nutrition

Investigators are encouraged to contact Dr. Dionne Toombs, National Program Leader for SBIR Food Science and Nutrition at dtoombs@nifa.usda.gov regarding questions about the suitability of research topics or to arrange a telephone consultation (202) 401-2138.

Background

The Food Science and Nutrition topic area aims to fund projects that support research focusing on developing new and improved processes, technologies, or services that address emerging food safety issues. The program will fund projects that develop novel rapid detection methods for food-borne pathogens and toxic metabolites to reduce food contamination and food-borne illnesses. The program will fund projects that increase the understanding of the characteristics of food that include: the physical, chemical and biological components of food; and improved methods for the processing and packaging of food products to improve food quality; and nutrition-related technologies and processes that will improve health and reduce obesity. The outcome of a successful project is a proof of concept for a marketable item or patented process.

The long term goals (10 years) of the program are to commercialize the production of useful new food products, processes, materials, and systems, reduce food-borne illness as well as to apply information to addresses nutrition-related issues and improve and protect the Nation's food supply.

FY 2012 Research Priorities:

1. Developing sensor technologies for the detection of microorganisms and improved methods for rapid detection of microorganisms during post-harvest, processing, and distribution.
Examples of common food-borne pathogens:
 - i. Shiga toxin producing E. Coli in non-intact beef
 - ii. E. Coli O157:H7 associated with fruits and vegetables
 - iii. Noroviruses and other food-borne viruses associated with produce and seafood
 - iv. Salmonella and Campylobacter species associated with poultry
2. Developing innovative food processing and packaging technologies and specialty products or processes using minimally or non-thermal techniques for food preservation.
3. Developing affordable food ingredients and/or food formulations that contribute to the prevention of obesity while maintaining the sensory characteristics.
4. Developing and using interactive, information technology for nutrition educators and teachers to increase nutrition awareness and improve health and intervention strategies to address obesity among children.

Other Key Information

- **ALL ATTACHMENTS MUST BE SUBMITTED IN THE PORTABLE DOCUMENT FORMAT (PDF).**
- All Phase I applications should give the reviewing community a brief vision of where the PD expects the project to be at the end of Phase II (entering Phase III commercialization).
- Applications exceeding the budget limitation or exceeding the page limit or not meeting the formatting requirements will be excluded from NIFA review.

- The applicants are strongly encouraged to contact the National Program Leader regarding the suitability of research topics.
- Improvements of current commercial methods should address high false positive rates associated with PCR based methods for detection of food borne bacteria in produce and high false negative rates associated with immunoassays for detection of Salmonella.
- New rapid detect tests should be designed to detect at least 1 cfu/25g of food using approaches that reduce or eliminate enrichment and should be designed to allow for sampling of large volumes of food.
- Projects that promote value-added products and processes are encouraged.
- Projects that address functional foods to promote health are encouraged.
- Projects on novel screening methods for threat agents need strong letters of support from the appropriate Federal agency that will be the end user of the technology.
- Projects that focus on technologies for improving cost benefit and model-based analyses, including distribution, warehousing, and retailing systems as they relate to the economy are acceptable.
- Applicants who have received previous SBIR funding should address outcomes for those projects.

Projects should include appropriate collaborations with experts in the field of investigation i.e. a Food Chemist, Food Microbiologist, or Nutritionist as a part of the development team for the project.

8.6 Rural Development

Investigators are encouraged to contact Dr. Suresh Sureshwaran, National Program Leader for SBIR Rural Development at ssureshwaran@nifa.usda.gov regarding questions about the suitability of research topics or to arrange a telephone consultation (202) 720-7536.

Background

During the last 30 years, dramatic social, economic and technological changes have occurred in many rural areas in the United States. Although farming continues to be an important source of income, most of rural America is moving from an agrarian to post-agrarian economy. The results of this transformation have been uneven across the rural landscape. Some communities are facing economic decline and rural exodus, while in other communities, especially those in areas near large urban centers or rich in natural amenities, economic and population growth have accelerated. Even in rural communities where economic growth and population have grown, some have become more vulnerable to disasters caused by human action and/or climate changes. Many other communities are plagued by limited access to good schools, food, and health services. As a result, despite decades of intervention and billions of dollars in public investment, many rural residents are unable to utilize important government services and new scientific information that can help improve their quality of life; have higher food insecurity and childhood obesity rates; lack the required entrepreneurship and workforce skills to take advantage of emerging economic opportunities (e.g., climate change mitigation, safe food processing and marketing, etc); and are hampered by insufficient modern infrastructure to rapidly benefit from growing public and private sector investment.

Applications may be submitted for the development of new technology, or for the utilization of existing technology, that address important economic and social development issues or problems in rural America. The applications need not be centered on agriculture, but may be focused on any area that has the potential to provide significant benefits to rural Americans. All applications should explicitly discuss the specific rural problem or opportunity that will be examined and how this technology will successfully address the problem or opportunity. Applications submitted must include an objective to assess the impacts of the proposed project on the environment or the socio-economic development of rural areas.

To meet these identified problems and opportunities of rural development, the long-term (10 year) goal for this program is to develop and commercialize new technology, products, processes and services that will: (i) enhance the efficiency and equity of public and private investment in rural communities; (ii) build a diversified workforce to meet the needs of the present and for the future; (iii) enhance resilience to both natural and human disasters; and (iv) enhance economic vitality of rural communities and, in turn, reduce rural poverty.

FY 2012 Research Priorities:

Examples of appropriate subtopics for research proposals from small businesses include, but are not limited to, the following:

1. **Development of services and information and managerial systems that improve the efficiency and effectiveness of Local Governments and Public and Private Institutions.** Topics may include educational programs that address the specific needs of people in rural areas (e.g., development of entrepreneurship and workforce skills); new housing designs; improved health care delivery; appropriate transportation and communication technologies and services; and marketing of new information and technologies.
2. **Development of technologies and services that protect or enhance the environment while promoting economic development.** Topics may include technologies and services that promote

rural tourism, protect the ecosystem, conserve energy, develop alternative energy sources such as wind and solar energy (excluding biofuels), etc.

3. **Reducing the vulnerabilities of rural communities from hazards (excluding intentional acts such as terrorism).** Procedures are needed to make rural communities more sustainable to natural or unintentional hazards such as food-borne illnesses, food contamination, droughts, hurricanes, etc., through better preparation, forecast and warning, response and rebuilding phases of hazard mitigation, including communication.
4. **Development of technologies and services that specifically address the needs of youth and the low-income sector of the rural population.** Efforts are need that will enhance human capital development, build earnings capacity, increase labor force participation and/or promote job creation to the most vulnerable populations in rural communities.

Other Key Information

- **ALL ATTACHMENTS MUST BE SUBMITTED IN THE PORTABLE DOCUMENT FORMAT (PDF).**
- All Phase I applications should give the reviewing community a brief vision of where the PD expects the project to be at the end of Phase II (entering Phase III commercialization).
- Applications exceeding the budget limitation or exceeding the page limit or not meeting the formatting requirements will be excluded from NIFA review.
- The applicants are strongly encouraged to contact the National Program Leader regarding the suitability of research topics.
- If funded, projects are expected to enhance the environmental and economic vitality of rural communities. Therefore, applications must contain an objective to assess the impacts of the proposed project on the environment or the socio-economic development of rural areas. Applications that do not address this will not be reviewed.
- Applications dealing with on-farm production agriculture research should be submitted to topic area 8.12 Small and Medium Sized Farms.
- Applications dealing with the development of biofuels and biobased products should be submitted to topic area 8.8 Biofuels and Biobased Products.

8.7 Aquaculture

Investigators with questions about the suitability of research topics or to arrange a telephone consultation are encouraged to contact either, 1) Dr. Charles Cleland, National Program Leader for SBIR Aquaculture at ccleland@nifa.usda.gov, (202) 401-6852 or 2) Dr. Gary Jensen, National Program Leader for SBIR Aquaculture at gjensen@nifa.usda.gov, 202-401-6802.

Background

The Aquaculture topic area aims to develop new technologies that will enhance the knowledge and technology base necessary for the continued growth of the domestic aquaculture industry as a form of production agriculture. Seafood production from the wild is under increased pressure due to overfishing and pollution and therefore aquaculture is increasingly becoming an important source of seafood and an important contributor to improve food security. In this context new technologies are needed to protect aquaculture species against disease and to improve production efficiency. Emphasis is placed on research leading to improved production efficiency and increased competitiveness of private sector aquaculture in the United States. Studies on commercially important, or potentially important, species of fish, shellfish and plants from both freshwater and marine environments are included. Food Safety is another important priority in Aquaculture. Technologies are needed to ensure the safety of aquaculture species from heavy metals and other hazardous materials and from human pathogens.

To meet these identified needs in aquaculture, the program's long-term goals (10 years) are to achieve improved aquaculture production resulting from improved reproductive efficiency in fish and shellfish; improved aquaculture production resulting from genetic improvement in fish and shellfish; improved aquaculture production resulting from improved animal health; improved aquaculture production with reduced water usage and improved production efficiencies; and cost-effective production of microalgae for use as aquaculture feed and as a source of valuable human food supplements.

FY 2012 Research Priorities:

Examples of appropriate subtopics for research applications from small businesses include, but are not limited to the following:

1. **Reproductive Efficiency** – Novel or innovative approaches to improve reproductive efficiency in aquaculture including: greater control of maturation, ovulation and fertilization; improved gamete and embryo storage; improved larval rearing techniques; enhanced reproductive performance of broodstock; improved methods for cryopreservation of sperm and embryos; and methods to control sex determination.
2. **Genetic Improvement** – Novel or innovative approaches to improve production efficiency through genetic improvement of aquacultural stocks including: genetic mechanisms of sex determination; genetic basis for inheritance of commercially important traits, such as growth, cold tolerance, and pathogen susceptibility; identification of major genes affecting performance; application of molecular biology and genomics and the integration of this technology into breeding programs; and performance evaluation of aquacultural stocks and utilization of crossbreeding and hybridization.
3. **Integrated Aquatic Animal Health Management** – Novel or innovative approaches to reducing acute and chronic losses related to aquatic animal health in aquaculture production systems through an integrated holistic approach including: physiological stress related to the quality of the aquatic production system; genetic, environmental, and nutritional components of aquatic health management; control of predation in aquaculture production systems; development of new vaccines

or immunization procedures to enhance resistance to infectious diseases and parasites; development of diagnostic tests for specific diseases that pose a health hazard; and development of improved treatment methods for acute or chronic health problems caused by specific infectious or non-infectious agents, parasites, injuries and chemical and toxic agents.

4. **Improved Production Systems and Management Strategies** – Novel or innovative approaches to improve existing or alternative production system design and management strategies including: development of biological, engineering and economic design criteria and models; enhancement of water quality in existing production systems through aeration, flow patterns, etc.; characterization, handling and treatment of effluent from aquacultural production systems; improved harvesting methods and strategies; and improved operating efficiencies for recirculation systems.
5. **Plant Production Systems** – Novel or innovative approaches to improve the efficiency of algal production systems including: identification of new species with improved nutritional profile for use in feeding to other aquacultural species or as a source of valuable human food supplements; development of improved bioreactor technology; and development of better methods for harvesting algal biomass.

Other Key Information

- **ALL ATTACHMENTS MUST BE SUBMITTED IN THE PORTABLE DOCUMENT FORMAT (PDF).**
- All Phase I applications should give the reviewing community a brief vision of where the PD expects the project to be at the end of Phase II (entering Phase III commercialization).
- Applications exceeding the budget limitation or exceeding the page limit or not meeting the formatting requirements will be excluded from NIFA review.
- The applicants are strongly encouraged to contact the National Program Leader regarding the suitability of research topics.
- Applications that deal with the development of new food products derived from aquaculture species should be submitted under topic area 8.5 Food Science and Nutrition.

8.8 Biofuels and Biobased Products

Investigators are encouraged to contact Dr. William Goldner, National Program Leader for SBIR Biofuels and Biobased Products at wgoldner@nifa.usda.gov regarding questions about the suitability of research topics or to arrange a telephone consultation (202) 401-1719.

Background

The objective of this topic area is to promote the use of biofuels and non-food biobased products by developing new or improved technologies that will lead to increased production of industrial products from agricultural materials. This research will lead to new opportunities to diversify agriculture and enhance agriculture's role as a reliable supplier of raw materials to industry. This topic area supports the NIFA Sustainable Bioenergy Societal Challenge Area and the Climate Change Societal Challenge Area. Historically, appropriate research areas have included: development of procedures for enhanced recovery of critical raw materials from agricultural commodities; development of improved technology for converting agriculturally derived raw materials into useful industrial products; development of new products from new industrial crops; and development of industrial products derived from agricultural materials to make them more effective and/or more cost competitive with non-agriculturally derived industrial products. In order to enhance the impact of the program, acceptance of applications will be limited to selected Research Priority Areas.

FY2012 Priority Research Areas

Acceptance of applications for the FY2012 solicitation will be **strictly limited** to:

1. **Advanced “Drop-in” Biofuels** – New and improved technology for the **economically and environmentally sustainable** production and conversion of agricultural biomass material **energy crops and residues** into non-ethanol biofuels (e. g. biobutanol, green gasoline, green diesel, aviation fuel), fuel additives, and other products to be used as fuel; development of improved biocatalysts and thermochemical processes for advanced biofuel production, and byproducts from the advanced biofuel production stream that will optimize the economic feasibility of the production of biofuels. This solicitation seeks to support innovative technologies that will minimize adverse environmental impacts during conversion (for example: reduction of energy use and water use during conversion; reduction of harmful byproducts from conversion) and have carbon reduction benefits. Applications developing technology for ethanol production (grain or cellulosic) or co-products from ethanol production will not be accepted in this topic area, but may be submitted to other topic areas if appropriate (see Other Key Information below). Applications not addressing economic and environmental sustainability may be returned to the applicant without review.
2. Advanced biofuels and biobased products from **animal manure** or carcass waste.
3. **New Non-food Biobased Products from New Industrial Crops** – Identification of markets and development of new biobased products and processes for making products from **new industrial crops (including algae)**. These products should be economically competitive and have carbon reduction benefits.
4. New processes for the manufacture of **biobased plastics**.

5. New products or processes that develop **biobased materials** with properties **that enhance energy efficiency** in their applications.

Other Key Information

- **ALL ATTACHMENTS MUST BE SUBMITTED IN THE PORTABLE DOCUMENT FORMAT (PDF).**
- All Phase I applications should give the reviewing community a brief vision of where the PD expects the project to be at the end of Phase II (entering Phase III commercialization).
- Applications that deal with developing value-added biofuels (including ethanol) and biobased products from forest biomass should be sent to the 8.1 Forest and Related Resources topic area.
- Applications that deal with developing biofuels (including ethanol) and bioenergy that will improve the sustainability of small and mid-size farms should be sent to the 8.12 Small and Mid-Size Farms topic area.
- Applications that deal with the genetic improvement or production of biomass feedstock crops except for woody biomass and algae should be submitted to the 8.2 Plant Production and Protection – Biology topic area.
- Applications that deal with the genetic improvement, production, or feedstock logistics of woody biomass feedstock crops should be submitted to the 8.1 Forest and Related Resources topic area.
- Applications that deal with the genetic improvement, production, or feedstock logistics of algae for biofuel production should be submitted to the 8.7 Aquaculture topic area.
- Applications that deal with the engineering aspects of the planting, production or post-harvest handling of biomass feedstock crops should be submitted to the 8.13 Plant Production and Protection – Engineering topic area.
- Applications submitted to this topic area that do not specifically address the FY2012 Priority Research Areas will not be reviewed.
- Applications exceeding the budget limitation or exceeding the page limit or not meeting the formatting requirements will be excluded from NIFA review.

8.12 Small and Mid-Size Farms

Investigators are encouraged to contact Dr. Charles Cleland, National Program Leader for SBIR Small and Mid-Size Farms at ccleland@nifa.usda.gov regarding questions about the suitability of research topics or to arrange a telephone consultation (202) 401-6852.

Background

The Small and Mid-Size Farms topic area aims to promote and improve the sustainability and profitability of small and mid-size farms and ranches (where annual sales of agricultural products are less than \$250,000 for small farms and \$500,000 for mid-size farms - hereafter referred to as small farms). The vast majority of farms in this country are small and they play an important role in the agricultural sector. The viability and sustainability of small farms is important to the Nation's economy and to the stewardship of our biological and natural resources. Small farms are also critical to sustaining and strengthening the leadership and social fabric of rural communities. Applicants are strongly encouraged to emphasize how their project would contribute to the well-being of rural communities and institutions. In particular, applicants should emphasize how the results of their project would be disseminated to other small farmers and provide benefit to the small farm community.

Food safety, climate change, food security and sustainable bioenergy are all important program priorities in this topic area. Proposals are encouraged that focus on one or more of these priorities and are appropriately scaled so as to apply to the needs and capabilities of small farmers.

To meet these identified needs in the small and mid-size farm sector, the program's long-term goals (10 years) are to achieve improvements in sustainability and profitability of small farms with increased production of specialty crops and specialty animals; improved farm management skills in small farmers that leads to more sustainable and profitable small farms; better stewardship of natural resources through adoption of more sustainable farming practices; enhanced utilization of renewable energy sources and more focus on energy efficiency and energy conservation; and better educated small farmers who are better able to operate their farms on a sustainable and profitable basis.

FY 2012 Research Priorities:

Examples of appropriate subtopics for research applications from small businesses include, but are not limited to the following:

1. **New Agricultural Enterprises** – Efforts are needed to develop new agricultural enterprises that are small scale and focused on specialty farm products, both plant and animal, and on innovative ways to market these farm products through direct marketing, such as farmer's markets or cooperatives where the financial return to the farmer is optimized or through specialty market outlets that offer a higher financial return. Emphasis is encouraged for organic and natural foods, specialty animal products, such as free-range poultry or natural beef, non-food specialty crops, such as medicinal herbs and value-added food, and non-food products.
2. **Development of New Marketing Strategies** – Efforts are needed to develop appropriate new strategies for marketing agricultural, forestry and aquacultural commodities and value-added products produced by small farms in local, regional, national and international markets, including the assessment of consumer demand; identification of desired product characteristics, including packaging and processing methods; development of new and innovative utilization of existing production and processing technologies; and the promotion of efficient assembling, packing, processing, advertising and shipping methods.

3. **Farm Management** – Efforts are needed to develop tools and skills that are appropriate for small farms that will enhance the efficiency and profitability of small farms. New tools are also needed that will enhance farm safety. Development of new risk management tools to facilitate better planning is needed. Innovative ways to promote agro-tourism as a way to enhance farm profitability is encouraged.
4. **Natural Resources and Renewable Energy** – Efforts are needed to develop farming methods scaled appropriately for small farms that are directed at more efficient use of natural resources. Particular emphasis is needed to develop better ways to utilize renewable energy sources, such as wind, solar, and geothermal energy, and to promote improved energy efficiency and conservation in farming operations.
5. **Educational Outreach** – Efforts are needed to develop new tools to ensure that the next generation of small farmers has access to the information and resources they need to operate their small farms on a sustainable and profitable basis.

Other Key Information

- **ALL ATTACHMENTS MUST BE SUBMITTED IN THE PORTABLE DOCUMENT FORMAT (PDF).**
- All Phase I applications should give the reviewing community a brief vision of where the PD expects the project to be at the end of Phase II (entering Phase III commercialization).
- Applications exceeding the budget limitation or exceeding the page limit or not meeting the formatting requirements will be excluded from NIFA review.
- The applicants are strongly encouraged to contact the National Program Leader regarding the suitability of research topic.

8.13 Plant Production and Protection - Engineering

Investigators are encouraged to contact Dr. William Goldner, National Program Leader for SBIR Plant Production and Protection - Engineering at wgoldner@nifa.usda.gov regarding questions about the suitability of research topics or to arrange a telephone consultation (202) 401-1719.

Background

The objective of this topic area is to examine means of enhance crop production by reducing the impact of harmful agents and developing effective crop production systems that are economically and environmentally sound. Projects that promote energy conservation or efficiency are strongly encouraged. Examples of appropriate subtopics for research applications from small businesses include, but are not limited to the following:

1. **Improved crop production methods or strategies** – Enhance the efficiency of crop production by utilizing innovative methods and equipment for planting, growing and harvesting crop plants, including optimization of inputs and reduction of environmental impacts by implementing the use of precision farming technology, sensors, information technology, and remote sensing.
2. **Plant protection** – Reduce the impact of plant pathogens, insect pests and competing vegetation on crop plants by developing efficient and environmentally safe pesticide and herbicide usage equipment, especially technology to monitor and manage plant disease, insect pests, or abiotic stress at the earliest stages of their manifestations.
3. **Energy conservation** – Develop crop management systems, farm and greenhouse structures, and waste utilization strategies that promote energy conservation and efficiency, including the development of technology for the economic use of alternative/renewable energy resources.

Special Priority Research Areas for FY 2012: SBIR is strongly encouraging the submission of applications focusing on the following problem areas. Additional consideration will be given to applications addressing the development of products, processes, and services for US production of specialty crops (fruits, nuts, vegetables, nursery, and greenhouse crops):

1. **Improved chemical application technology** that increases efficacy, worker safety, and reduces off-target drift of applied chemicals.
2. **High resolution spatial and temporal monitoring** of specialty crops using sensors and sensor networks (for example, temperature, humidity, drought stress, pest damage, and disease).
3. **Post-harvest handling of specialty crops**, including handling to maintain quality and reduce food safety issues, reducing waste streams from post-harvest handling, selection for quality and consumer preference.
4. **Reduction of manual labor in specialty crop production, harvesting, and post-harvest handling** through technology to improve the competitiveness of US specialty crop production.
5. **Commercial floriculture production technology** to improve the competitiveness of U.S. flowering potted plant, bedding plant, and cut flower production, seasonal crops, annuals, and perennials.
6. **Planting, production, harvesting, and post-harvest handling technology** targeting the sustainable production of the following **biomass feedstock crop groups: perennial grasses,**

energycane, sorghum, and oil seed crops (not including algae, see Other Key Information below).

7. Technology to enhance the competitiveness of U.S. Organic agriculture and horticulture.

Other Key Information

- **ALL ATTACHMENTS MUST BE SUBMITTED IN THE PORTABLE DOCUMENT FORMAT (PDF).**
- All Phase I applications should give the reviewing community a brief vision of where the PD expects the project to be at the end of Phase II (entering Phase III commercialization).
- Applications that deal with irrigation and related technology should be sent to the 8.4 Soil and Water Resources topic area.
- Applications that deal with the feedstock logistics of woody biomass (including short rotation crops like willow and poplar) should be submitted to the 8.1 Forest and Related Resources topic area.
- Applications that deal with the production of algae for biofuel production should be submitted to the 8.7 Aquaculture topic area.
- Applications exceeding the budget limitation or exceeding the page limit or not meeting the formatting requirements will be excluded from NIFA review.

9.0 SUBMISSION FORMS AND CERTIFICATIONS

All of the necessary forms and instructions will be found on the Grants.gov Web site. One way applicants can access the appropriate page on Grants.gov by visiting the USDA SBIR funding opportunity page at <http://www.nifa.usda.gov/fo/sbir>. Clicking on the Funding Opportunity Number listed near the bottom of the page will link the applicant directly to the information and forms necessary to submit through Grants.gov. **Please note: Applicants must have successfully completed the entire registration process, see subsection 3.2 prior to submitting an application through Grants.gov. All attachments must be submitted in PDF format, see subsection 3.2.3.**

10. 0 SAMPLE APPLICATIONS FROM USDA SBIR SOLICITATION

These applications, which resulted in Phase I awards, were submitted under previous USDA SBIR Program Solicitation guidelines. As such, these applications do not accurately reflect the current format nor the forms and attachments that are required for submission through Grants.gov. The sample applications are provided solely for general guidance. In the original application, the cover page was signed by both the Project Director and Authorized Organizational Representative. Social security numbers, budgets, and some material containing biographical information have been deleted to protect confidentiality.

Visit the Web to see the sample applications available only in PDF version at:
www.nifa.usda.gov/funding/sbir/sbir_sample.html