



# **REQUEST FOR APPLICATIONS**

## **Small Business Innovation Research and Small Business Technology Transfer Programs Phase I**

**MODIFICATIONS:** Pages 1, 2, 9, 10, 11, 13, 14, 16, 18, 20, 22, 23, 26, 28, 44, and 59

**FUNDING YEAR:** Fiscal Year 2023

**APPLICATION DEADLINES:** FY 2023: October 25, 2022

**LETTER OF INTENT DEADLINE:** Not Required

**FUNDING AVAILABILITY:** \$13,000,000 for SBIR/\$2,500,000 for STTR

**ASSISTANCE LISTING NUMBER:** 10.212

**FUNDING OPPORTUNITY NUMBER:** USDA-NIFA-SBIR-009301

**INITIAL ANNOUNCEMENT**  
National Institute of Food and Agriculture  
United States Department of Agriculture

**Assistance Listing Number (ALN):** The Phase I Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) applications are provided in the Assistance Listings under number 10.212.

**1) Key Dates and Deadlines**

- a) **Application Deadline:** FY 2023, 5:00 P.M. Eastern, October 25, 2022
- b) **Letter of Intent:** Not Required
- c) **Applicants Comments:** Within six months from the issuance of this notice (NIFA may not consider comments received after the sixth month)

**Advancing Diversity, Equity, Inclusion, and Accessibility (DEIA).** NIFA recognizes research, education, and extension efforts will have the greatest impacts when equity is grounded in the programs. NIFA is committed to enhancing diversity, equity, inclusion, and accessibility of programs and encourages individuals, institutions, and organizations from underserved communities to apply to funding opportunities as lead, co-lead, or subaward recipient(s), and to engage as leaders in the peer panel review process to support the development of strong networks and collaborations. NIFA encourages applications that engage diverse communities and have broad impacts through research, education, extension, and integrated activities to address current and future challenges.

**Stakeholder Input.** The National Institute of Food and Agriculture (NIFA) seeks comments on all request for applications (RFAs) so it can deliver programs efficiently, effectively, with integrity, and with a focus on customer service. NIFA considers comments, to the extent possible when developing RFAs and use comments to help meet the requirements of [§ 103\(c\)\(2\) of the Agricultural Research, Extension, and Education Reform Act of 1998 \(7 U.S.C. 7613\(c\)\(2\)\)](#). Applicants may submit written comments to [Policy@usda.gov](mailto:Policy@usda.gov) (email is for comments only). Please use the following subject line: Response to the Small Business Innovation Research and Small Business Technology Transfer Phase I RFA.

## EXECUTIVE SUMMARY

This notice identifies the objectives for the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Phase I projects, deadlines, funding information, eligibility criteria for projects and applicants, and application forms and associated instructions.

The USDA SBIR/STTR programs focus on transforming scientific discovery into products and services with commercial potential and/or societal benefit. Unlike fundamental research, the USDA SBIR/STTR programs support small businesses in the creation of innovative, disruptive technologies and enable the application of research advancements from conception into the market. The STTR program aims to foster technology transfer through formal cooperative R&D between small businesses and nonprofit research institutions.

Different from most other investors, the USDA SBIR/STTR Programs fund early or "seed" stage research and development that has a commercial potential. The programs provide equity-free funding and entrepreneurial support at the earliest stages of company and technology development.

Key differences between USDA's SBIR and STTR programs include the percentage of research conducted by the nonprofit research institutions (e.g., Universities, Federal Laboratories) that requires a formal cooperative agreement detailing the allocation of intellectual property rights to carry out follow-on research, development, or commercialization activities for STTR applicants and the primary employment of the project's principal investigator.

The current authorization for the Small Business Innovation Research and the Small Business Technology Transfer grant programs expire on September 30, 2022. The 2023 RFA is being released prior to the passage of the program being reauthorized. Enactment of reauthorizing legislation is needed by September 30, 2022, in order for NIFA to implement the programs and make awards for fiscal year 2023.

Additionally, this RFA is being released prior to the passage of an appropriations act for FY 2023. Enactment of additional continuing resolutions or an appropriations act may affect the availability or level of funding for these programs and may delay the start date of Phase I grants.

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## **PART I. FUNDING OPPORTUNITY DESCRIPTION**

### **A. Legislative Authority**

The current authorization for the SBIR/STTR programs expire on September 30, 2022. The 2023 RFA is being released prior to the passage of the program being reauthorized. Enactment of reauthorizing legislation is needed by September 30, 2022, in order for NIFA to implement the programs and make awards for fiscal year 2023.

The SBIR and STTR programs are authorized under the Small Business Innovation Development Act (P.L. 97-219), 15 U.S.C. § 638(m), (n)(1). In 2016, the authority for the programs was extended through September 30, 2022, by the National Defense Authorization Act for Fiscal Year 2017 (P.L. 114-328 § 1834 Extension of SBIR and STTR programs) which amended the SBIR/STTR Small Business Act ([15 U.S.C. § 638](#)) and extended its implementation through September 30, 2022. Policy is provided by the Small Business Administration (SBA) through the SBIR/STTR Policy Directive. A main purpose of the legislation is to stimulate technological innovation and increase private sector commercialization. The USDA SBIR/STTR programs are therefore in a unique position to meet both the goals of USDA and the purpose of the SBIR/STTR legislation by transforming scientific discovery and innovation into both social and economic benefit, and by emphasizing private sector commercialization.

The SBIR/STTR programs are congressionally mandated and intended to support scientific excellence and technological innovation through the investment of federal research funds to build a strong national economy by stimulating technological innovation in the private sector; strengthening the role of small business in meeting federal research and development needs; increasing the commercial application of federally supported research results; and fostering and encouraging participation by socially and economically disadvantaged and women-owned small businesses. Further, the objective of the STTR program is to stimulate formal cooperative partnerships of ideas and technologies between small businesses and nonprofit research institutions (e.g., Universities, Federal Laboratories).

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

Because the USDA programs currently have no specific procurement focus, the USDA offers ten (10) solicitation topic areas that are intended to permit a broad spectrum of eligible and innovative science- and technology-based small businesses to compete for funding. The topics are detailed within this solicitation.

These programs are administered by the National Institute of Food and Agriculture (NIFA) of the United States Department of Agriculture (USDA).

These programs are 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.

The USDA NIFA SBIR/STTR programs are carried out in three separate phases. These program

solicitations are only for the preparation and submission of Phase I applications. The aim of a Phase I project should be to demonstrate technical feasibility of the proposed innovation and thereby bring the innovation closer to commercialization. Proposals should describe the development of an innovation that demonstrates the following characteristics:

1. Involves a high degree of technical risk – for example, has never been attempted and/or successfully achieved and, is still facing technical hurdles (that the USDA-funded R&D work is intended to overcome).
2. Has the potential for significant commercial impact and/or societal benefit, as evidenced by having the potential to disrupt the targeted market segment; having good product-market fit (as validated by customers); removing barriers to entry for competition; offering potential for societal benefit (through commercialization under a sustainable business model).
3. Phase I awards may not exceed the listed maximum award amount for each Program Code for a period normally not to exceed eight (8) months for SBIR and twelve (12) months for STTR.
4. The Phase I application should concentrate on research that will significantly contribute to proving the scientific or technical feasibility of the approach or concept, describe the potential market for the innovation and will be a prerequisite to further USDA SBIR/STTR support in Phase II.

Phase II applications continue the R&D developed under Phase I to commercialize the innovation. Phase II will require a more comprehensive application, outlining the proposed effort in detail and the commercialization strategy for the effort. Only prior Phase I grant recipients are eligible to submit a Phase II application at the conclusion of the Phase I grant period. USDA NIFA SBIR/STTR typically announces the Phase II RFA in early December with a deadline in early March. USDA NIFA recognizes that Phase I and II awards may not be sufficient in either dollars or time for the firm to complete the total R/R&D and the commercialization activities required to bring the project results to a marketplace. Therefore, completion of the research under these circumstances may have to be carried into Phase III.

Phase III refers to work that derives from, extends, or logically concludes effort(s) performed under prior SBIR/STTR funding, but is funded by sources other than the SBIR/STTR Program. Phase III work is typically oriented towards commercialization of the SBIR/STTR innovation or technology.

**Global Engagement.** NIFA supports global engagement that advances U.S. agricultural goals. NIFA recognizes that collaboration with international partners may be necessary to attain the agency's goals for U.S. agriculture, promote global competence of our nation's future agricultural workforce, and promote safe and nutritious food security in a growing world. Therefore, although application to this RFA is limited to eligible U.S. institutions, applicants may collaborate with international partners, to include subcontracts to international partners or other institutions. Applications must clearly demonstrate benefits to the United States.

The Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Phase I Programs are aligned with the following [USDA Strategic Goals FY 2022-2026](#):

**Strategic Goal 1:** Combat Climate Change to Support America’s Working Lands, Natural Resources and Communities and specifically addresses Objectives 1.1, 1.2, 1.3, and 1.4.

**Strategic Goal 2:** Ensure America’s Agricultural System is Equitable, Resilient, and Prosperous and specifically addresses Objectives 2.1, 2.2, and 2.3.

**Strategic Goal 3:** Foster an Equitable and Competitive Marketplace for All Agricultural Producers and specifically addresses Objectives 3.1 and 3.2.

**Strategic Goal 4:** Provide All Americans Safe, Nutritious Food and specifically addresses Objectives 4.1, 4.2, and 4.3.

**Strategic Goal 5:** Expand Opportunities for Economic Development and Improve Quality of Life in Rural and Tribal Communities and specifically addresses Objectives 5.1, 5.2, 5.3, and 5.4.

### **C. Program Area Descriptions**

NIFA is soliciting applications under the following SBIR/STTR program areas:

1. Forests and Related Resources
2. Plant Production and Protection (Biology)
3. Animal Production and Protection
4. Conservation of Natural Resources
5. Food Science and Nutrition
6. Rural and Community Development
7. Aquaculture
8. Biofuels and Biobased Products
9. Small and Mid-size Farms
10. Plant Production and Protection (Engineering)

#### **Forests and Related Resources-Topic Area 8.1**

**Contact Dr. Diomides Zamora, NPL for SBIR/STTR Forests and Related Resources at [Diomides.Zamora@usda.gov](mailto:Diomides.Zamora@usda.gov) or (202) 590-6049** regarding questions about the suitability of research topics or to arrange a telephone consultation.

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, improve sustainability of forest resources, 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 that utilize nanotechnology in their approach to developing new wood-based products or that utilize wood-based nanomaterials are also 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 that are more resistant, resilient, and responsive to wildfires, the impact of pathogens and insects, and other disturbance events associated with climate change; improved environmental and economic methods of sustainable harvesting; and improved growth and yield of forest species that will lead to more efficient use of forested lands.

### **Forests and Related Resources Key Information**

Program Code: 8.1

Assistance Listing Number: 10.212

Project Type: Research

Grant Type: Standard

Application Deadline: FY 2023: 5 P.M. Eastern, October 25, 2022

Grant Duration: 8 Months SBIR/12 Months STTR

Anticipated Number of Awards: 6

Maximum Award Amount: \$175,000 or \$181,500 with Technical and Business Assistance (TABAs)

### **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 and through improved nutrient/water utilization; 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 the yield of lumber, pulp fiber and specialty chemicals from trees; utilizing a greater percentage of the tree through improved techniques of production, for the creation of new or improved reconstituted products; developing better methods for manufacturing wood-based products and testing 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, water degradation or other alterations caused by harvesting and/or other forest operations, provisions 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, such as greenways, parks, and strategically planted urban trees, to address problems of forest fragmentation, the introduction of invasive species, and the impact of urban forested land on air and water quality and quality of life improvements.

## **5. Climate Change**

Research to address the issue of ecosystem adaptation to climate change, ways to enhance carbon sequestration and reduce greenhouse gas emissions, development of decision support tools for forest managers to deal with various types of risks and uncertainties associated to climate change, and markets for forest ecosystem services.

## **6. Developing Technology that Facilitates the Management 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 cellulosic biofuels (e.g., ethanol, biobutanol, jet aviation) and biobased products, including intermediate chemicals; development of new wood-based composite materials; development of local scale energy conversion projects that generate electricity and/or useful heat; and development of technologies that will mitigate carbon release from combustion.

### **Other Key Information**

1. Applicants are strongly encouraged to contact the NPL regarding the suitability of research topics.
2. 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.

## **Plant Production and Protection (Biology)-Topic Area 8.2**

Contact Dr. Kari Perez, NPL for SBIR/STTR Plant Production and Protection (Biology) at [Kari.Perez@usda.gov](mailto:Kari.Perez@usda.gov) or (816) 550-8047 or Dr. Christopher Philips, NPL for SBIR/STTR Plant Production and Protection (Biology) at [Christopher.Philips@usda.gov](mailto:Christopher.Philips@usda.gov) or (216) 390-4211 regarding questions about the suitability of research topics or to arrange a telephone consultation.

The objective of this topic area is to examine novel ways of enhancing crop production and protection by applying biological approaches to develop new methods for plant improvement and pest management; apply traditional plant breeding methods and/or new technologies to develop new food and non-food crop plants, develop diagnostic technologies for plant diseases; develop plant characteristics that reduce the harmful impact of plant pests, biotic, and abiotic stresses, as well as new genotypes of existing crop plants with characteristics that allow for their use in new commercial applications.

## **Plant Production and Protection (Biology) Key Information**

Program Code: 8.2

Program Code Name: Plant Production and Protection (Biology)

Assistance Listing Number: 10.212

Project Type: Research

Grant Type: Standard

Application Deadline: FY 2023, 5 P.M. Eastern, October 25, 2022

Grant Duration: 8 Months SBIR/12 Months STTR

Anticipated Number of Awards: 7

Maximum Award Amount: \$175,000 or \$181,500 with TABA

### **Research Priorities:**

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

#### **1. Plant improvement**

Improved crop production using traditional plant breeding and biotechnology, including but not limited to, molecular biology, and mutagenesis, genomics, tissue culture, and/or embryogenesis to produce crops with new or improved quality, yield, agronomic, horticultural, value-added, and/or economic traits. Topics may include, but not limited to:

- a. Improvement of commercial floriculture production:  
Biological and/or technological approaches to improve the competitiveness of U.S. production of flowering potted plants, bedding plants, seasonal crops, annuals, perennials, and cut flowers.
- b. Development of new crops:  
Development of new crop plants as sources of food, non-food industrial or ornamental products.

#### **2. Pollinators and crop production**

Projects that address the health and success of domesticated and natural pollinators of economically important crops.

#### **3. Plant protection against abiotic and/or biotic stresses**

Reduce the impact of biotic stresses (including plant pathogens, arthropod pests, and weeds), and abiotic stresses on crop plants including topics focused on various types of risks and uncertainties associated to climate change; increasing plant resistance to plant pathogens, arthropod pests, and abiotic stress including abiotic stress factors related to climate change.

Topics may include, but are not limited to:

- i. Improved plant disease diagnostics- accurate, rapid, and cost-effective identification of causal agents in specialty crop plants at the earliest possible stage relative to manifestation of disease.

- ii. Bio-based approaches:  
To protect organically grown and conventional crops from insect and nematode pests and diseases using bio-based approaches, including the development of decision aid systems that are information extensive and time sensitive.

### **Other Key Information**

1. Applicants are strongly encouraged to contact the NPL regarding the suitability of research topics.
2. 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.
3. Applications that deal with non-biological engineering technologies should be submitted to topic area 8.13 Plant Production and Protection-Engineering.
4. 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.
5. Applications that deal with the genetic improvement and production of algae should be submitted to the 8.7 Aquaculture topic area.

### **Animal Production and Protection-Topic Area 8.3**

**Contact Dr. Robert Smith, NPL for SBIR/STTR Animal Production and Protection at [Robert.M.Smith@usda.gov](mailto:Robert.M.Smith@usda.gov) or (202) 445-3468 or Dr. Frank Siewerdt, NPL for SBIR/STTR Animal Production and Protection at [Frank.Siewerdt@usda.gov](mailto:Frank.Siewerdt@usda.gov) or (816) 329-9746** regarding questions about the suitability of research topics or to arrange a telephone consultation.

Protein and other nutrients from animal sources are an important component of diets worldwide. Agricultural animals also provide skins, fiber, feathers and other products with economic importance. There is a growing need for these products as the global population expands and demand becomes higher also due to more disposable income for hundreds of millions of people. 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 support the development of innovative, marketable technologies that will provide significant benefit to the production and protection of agricultural animals. New technologies for rapid detection, point-of-care, 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 develop and enhance alternatives to the use of antibiotics since pathogen resistance and human sensitivity to residue food products derived from animals have become of increasing concern. 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, especially those that address carbon sequestration processes and provide an outlet for manure. Technological advances in animal production and protection will not only enhance the safety of the Nation's food supply and contribute to environmental stewardship, but they will also allow American producers to remain competitive in the global marketplace and contribute to global food security.

## **Animal Production and Protection Key Information**

Program Code: 8.3

Program Code Name: Animal Production and Protection

Assistance Listing Number: 10.212

Project Type: Research

Grant Type: Standard

Application Deadline: FY 2023, 5 P.M. Eastern, October 25, 2022

Grant Duration: 8 Months SBIR/12 Months STTR

Anticipated Number of Awards: 7

Maximum Award Amount: \$175,000 or \$181,500 with TABA

## **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 rapid, more accurate, point-of-care oriented and competitively priced diagnostics, therapeutics, vaccines and other immunization methods, biosecurity management tools, traceability methods, and animal handling methods and developing alternatives to the use of antibiotics.

### **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 climate change and the impacts of animal agriculture on the natural environment**

Areas of interest include technologies that decrease greenhouse gas emissions, improve carbon sequestration, or reduce the content of excretion of phosphorus and nitrogen and other nutrients in the manure or excreta, but does not include manure management.

## **Other Key Information**

1. Applicants are strongly encouraged to contact the NPL regarding the suitability of research proposals for this topic area.
2. Applications that deal with post-harvest technologies for foods derived from animals should be submitted under topic area 8.5 Food Science and Nutrition.
3. Applications that deal with mitigation of pollution through manure management should be submitted under topic area 8.4 Conservation of Natural Resources.

4. Applications that deal with transformation of manure or carcass waste into production of biofuels and biobased products should be submitted under topic area 8.8 Biofuels and Biobased Products.
5. Applications that deal with aquaculture species should be submitted under topic area 8.7 Aquaculture.

#### **Conservation of Natural Resources-Topic Area 8.4**

**Contact Dr. Sandeep Kumar, NPL for SBIR/STTR Conservation of Natural Resources at [Sandeep.Kumar@usda.gov](mailto:Sandeep.Kumar@usda.gov) or (816) 832-7235** regarding questions about the suitability of research topics or to arrange a telephone consultation.

The goal of the program is to commercialize innovative technologies that are developed with the purpose to conserve, monitor, improve and/or protect the quality and/or quantity of natural resources and reduce potential waste streams while sustaining climate-smart, optimal farm and forest productivity and profitability. The objective of this topic area is the conservation of soil, water, air, and other natural resources on landscapes that produce agricultural, natural and forest/rangeland goods and services. We encourage new technologies and innovations applying circular agriculture principles that will make use of waste or byproducts, help improve soil health, reduce soil erosion, improve water and air quality, improve nutrient management and conserve and use water more effectively.

#### **Conservation of Natural Resources Key Information**

Program Code: 8.4

Program Code Name: Conservation of Natural Resources

Assistance Listing Number: 10.212

Project Type: Research

Grant Type: Standard

Application Deadline: FY 2023, 5 P.M. Eastern, October 25, 2022

Grant Duration: 8 Months SBIR/12 Months STTR

Anticipated Number of Awards: 8

Maximum Award Amount: \$175,000 or \$181,500 with TABA

#### **Research Priorities:**

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

##### **1. Water Quality and Quantity**

Develop new and innovative technologies to improve water management and conservation at the farm- and watershed-scales and monitor the quality of surface water and groundwater resources for biotic and abiotic pollutants. Create improved technologies focused on the use of nontraditional water sources (treated wastewater, agricultural return flows and produced water from minerals extraction) for agricultural irrigation, and improve irrigation technologies to provide superior timing, distribution and cost-effective delivery of water and chemicals for the optimal growth of agricultural products, natural and forest/rangeland goods and services.

## **2. Soil Health**

Research topic may include soil nutrient content, microbial functional activity related to nutrient cycling, methods to remediate degraded soils, methods to monitor and increase soil carbon storage capacity, and methods for monitoring and preventing soil erosion by wind and water.

## **3. 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, and methane capture for use on- or off-farm.

## **4. Nutrient Management**

Develop new and improved technologies to extract and utilize nutrients, and macro- and micronutrient management practices that help maximize plant productivity while minimizing negative environmental impacts.

## **Other Key Information**

1. Applicants are strongly encouraged to contact the NPL regarding the suitability of research topics.
2. Applications that include software development or other data-intensive technologies are encouraged to apply for topics related to the Priority Research Areas listed above.
3. Applications that address animal manure or carcass waste to produce biofuels and biobased products should be submitted to the SBIR/STTR 8.8 Biofuels and Biobased Products topic area.
4. Applicants should demonstrate that the proposed technology is innovative and not redundant with what is currently available. If similar technologies exist, please provide a comparison table contrasting your technology with others.
5. Technologies for the rapid detection of food borne hazards (microorganisms, chemicals, toxins) during pre- and post-harvest processing and distribution should be submitted to the SBIR/STTR 8.5 Food Science and Nutrition topic area.

## **Food Science and Nutrition- Topic Area 8.5**

**Contact Dr. Jodi Williams, NPL for SBIR/STTR Food Science and Nutrition at [Jodi.Williams@usda.gov](mailto:Jodi.Williams@usda.gov) or (202) 424-9722** regarding questions about the suitability of research topics or to arrange a telephone consultation.

The Food Science and Nutrition topic area aims to fund projects that support research focusing on developing new and improved processes, technologies, products, or services that address emerging food safety, food processing and nutrition issues. The program will fund projects to: 1) increase the understanding of the physical, chemical, and biological properties of food; 2) improve methods for the processing and packaging of food products to improve the quality, safety and nutritional value of foods, and to reduce food waste; 3) develop technologies for rapid, sensitive, reliable and robust detection of pathogens and chemical hazardous materials in foods, 4) develop programs or products that encourage the consumption of healthy foods and reduce diet related chronic diseases, or alleviate urban and rural food deserts; and 5) Develop

products to drive climate-smart food systems to ensure safe, accessible and nutritious food supply.

The outcome of a successful project is a proof of concept for a marketable product 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 that reduce foodborne illness, carbon footprints, improve nutrition and health, enhance the nutritional quality and value of foods and/or bridge socioeconomic gaps in access to healthy foods/sustainable, resilient food practices.

### **Food Science and Nutrition Key Information**

Program Code: 8.5

Program Code Name: Food Science and Nutrition

Assisted Listing Number: 10.212

Project Type: Research

Grant Type: Standard

Application Deadline: FY 2023, 5 P.M. Eastern, October 25, 2022

Grant Duration: 8 Months SBIR/12 Months STTR

Anticipated Number of Awards: 11

Maximum Award Amount: \$175,000 or \$181,500 with TABA

### **Research Priorities:**

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

#### **1. Food Safety**

Developing sustainable technologies for the detection or mitigation of foodborne hazards (microorganisms, chemicals, toxins) during pre- and post-harvest processing and distribution.

#### **2. Food Quality-Engineering**

Developing innovative processing, packaging and sanitation technologies or materials that reduce post-harvest losses in foods and food waste while maintaining safety, quality, and nutrition, and/or extending shelf life of the product.

#### **3. Food Quality-Science**

Understanding the physical, biological, and chemical interactions and functionality of food in order to develop affordable food ingredients and/or food formulations that contribute to the development of high-quality foods.

#### **4. Nutrition-Education**

Developing and implementing effective programs with an equity lens. Program audiences may include educators, parents, or community health workers to foster healthy nutritional choices to combat diet-related chronic disease.



## **5. Nutrition-Science**

Improve functionality and efficacy of foods, nutrients and/or dietary bioactive components in promoting and sustaining health. Strategies to promote and sustain health may include synthesizing available data in a responsible and ethical manner to develop personalized recommendations.

## **6. Nutrition Security, Food Safety and Quality Data Tools**

Development of portable tools and technologies that collect and analyze food intake, nutrient data, food safety and food quality data to enable producers, consumers and retailers make healthy choices and/or alleviate food deserts to support a resilient food system.

## **Other Key Information**

1. Applicants are strongly encouraged to contact the NPL regarding the suitability of research topics.
2. Improvements of current commercial methods should address high false positive and high false negative rates associated with nucleic acid-based methods for detection of food-borne pathogens in produce and high false negative rates associated with immunoassays for detection of Salmonella.
3. New rapid detection 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.
4. 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.
5. Projects that promote value-added products and processes are encouraged.
6. Projects that address functional foods to promote health are encouraged.
7. Projects that exclusively focus on nutritional supplements rather than food ingredients will not be considered.
8. 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.
9. Consumer focused projects to reduce post-harvest food losses and food waste are encouraged.
10. Projects focused on the pre-harvest systems (including soil nutrient and water content and/or air quality) rather than human health outcomes should go to 8.4 Conservation of Natural Resources.
11. Applicants who have received previous SBIR/STTR funding should address outcomes for those projects.
12. Projects should include appropriate collaborations with experts in the field of investigation (i.e., a food scientist or nutritionist as a part of the development team for the project).

## **Rural and Community Development-Topic Area 8.6**

Contact Dr. Keith Harris, NPL for SBIR/STTR Rural and Community Development at [Keith.Harris@usda.gov](mailto:Keith.Harris@usda.gov) or (816) 916-0332 regarding questions about the suitability of research topics or to arrange a telephone consultation.

The objective of this topic area is to improve the quality of life in rural America by creating and commercializing technologies that address important economic and social development issues or challenges in rural America. Projects must explicitly discuss the specific rural problem or opportunity that will be examined and how the proposed science-based technology will successfully address the problem or opportunity. Applications must also include an objective to assess the impacts of the proposed project on protecting or enhancing the environment, on climate mitigation or adaptation, or the socio-economic development of rural areas. The applications need not be centered on agriculture but may be focused on any area that has the potential to provide significant benefit to rural Americans. USDA seeks a balanced portfolio that appropriately mixes high risk, high reward innovations with new applications of existing technologies.

### **Rural and Community Development Key Information**

Program Code: 8.6

Program Code Name: Rural and Community Development

Assistance Listing Number: 10.212

Project Type: Research

Grant Type: Standard

Application Deadline: FY 2023, 5 P.M. Eastern, October 25, 2022

Grant Duration: 8 Months SBIR/12 Months STTR

Anticipated Number of Awards: 9

Maximum Award Amount: \$125,000 or \$131,500 with TABA

### **Research Priorities:**

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

#### **1. Development of services, information, and managerial systems that improve the efficiency and effectiveness of Local Governments and Public and Private Institutions.**

Topics may include educational programs, including virtual platforms, apps and gaming, which address the specific needs of people in rural areas (e.g., development of entrepreneurship and workforce skills); use of big data in community development planning; new housing designs or ways to improve function and outcomes of existing designs; improved health care delivery, including mobile or virtual health applications; innovative transportation and communication technologies and services that increase access to services for rural people; and marketing of new information and technologies to rural audiences, including strategies that promote diversity, equity, and inclusion.

#### **2. Development of technologies and services that protect or enhance the environment and address climate change while promoting economic development.**

Topics may include science-based innovations that explore the vast natural resources and amenities in rural communities with a focus on renewable energy. Examples may include technologies and services for harnessing big data to synthesize and communicate new knowledge for rural people, to help them make predictive decisions, and to foster data-driven innovation in agriculture, ecosystem protection, sustainable practices, food loss and waste reduction, energy conservation, and alternative energy source development – such as wind and solar energy (excluding biofuels).

### **3. Reducing the vulnerabilities of rural communities from hazards (excluding intentional acts such as terrorism).**

Procedures and data-enabled solutions are needed to make rural communities more resilient to natural or unintentional hazards such as food-borne illnesses, food contamination, droughts, wildfires, hurricanes, climate variability change, and pandemics 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, older adults, individuals with a disability, military veterans, and the low-income sector of the rural population.**

Efforts are needed 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. Topics that promote workforce development in rural communities, including working from home and promoting food security, including issues of access to adequate amounts and quality of foods, are encouraged.

### **5. Increasing opportunities for employment and income generation in rural communities.**

Topics may include, but are not limited to, innovations for a post-pandemic economy, creative place making, recreational economies, rural tourism, agritourism, e-commerce innovations that connect producers with markets, and off-farm value-added agricultural development.

### **6. Expanding broadband access in rural communities.**

Rural broadband access and utilization is a major expansion opportunity. Topics may include, but are not limited to, exploration of white space and other spectrums in rural communities; technologies that increase rural bandwidth, connection speed, quality, and reach; initiatives that increase awareness, adoption, and diffusion of broadband among rural people; and opportunities to increase investment in rural broadband infrastructure.

### **Other Key Information**

1. Applicants are strongly encouraged to contact the NPL regarding the suitability of research topics.
2. Because this topic area addresses impact on rural communities, community letters of support are highly encouraged.
3. If funded, projects are expected to be science-based and 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.
4. Projects are expected to provide evidence of the rural market to be served. Moreover, PDs should identify any barriers to commercialization and discuss how they propose to address them during this and all future phases.
5. Applications dealing with on-farm production agriculture research should be submitted to topic area 8.12 Small and Mid-Size Farms.
6. Applications dealing with the development of biofuels and biobased products should be submitted to topic area 8.8 Biofuels and Biobased Products.

## **Aquaculture-Topic Area 8.7**

**Contact Dr. Timothy Sullivan, NPL for SBIR/STTR Aquaculture at [Timothy.Sullivan@usda.gov](mailto:Timothy.Sullivan@usda.gov) or (816) 527-5434** regarding questions about the suitability of research topics or to arrange a telephone consultation.

The Aquaculture topic area funds research projects with the overall goal of leading to improved production efficiency and increased competitiveness of private sector, commercial aquaculture in the United States. This topic area aims to develop new technologies that will enhance the knowledge and technology base necessary for the expansion of the domestic aquaculture industry. Seafood production from the wild is under increased pressure due to overfishing, and therefore aquaculture is increasingly an important source of farmed seafood and an important contributor to food security. Studies on commercially important species of fish, shellfish and aquatic plants from both freshwater and marine environments are included. In this context, new technologies are needed to improve production efficiency, protect aquaculture species against disease, and ensure the quality of farmed seafood.

### **Aquaculture Key Information**

Program Code: 8.7

Program Code Name: Aquaculture

Assistance Listing Number: 10.212

Project Type: Research

Grant Type: Standard

Application Deadline: FY 2023, 5 P.M. Eastern, October 25, 2022

Grant Duration: 8 Months SBIR/12 Months STTR

Anticipated Number of Awards: 6

Maximum Award Amount: \$175,000 or \$181,500 with TABA

### **Research Priorities:**

To address identified needs or constraints that limit U.S. aquaculture, the following are provided as examples of appropriate subtopics for research applications from small businesses, including but not limited to, the following:

#### **1. Reproductive Efficiency**

Novel or innovative approaches to improve reproductive efficiency in aquaculture species 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 aquaculture species including: genetic mechanisms of sex determination; genetic basis for inheritance of commercially important traits, such as growth, temperature tolerance, and disease 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 aquaculture species and utilization of crossbreeding and hybridization.

### **3. Integrated Aquatic Animal Health Management**

Novel or innovative approaches to reducing losses due to aquatic animal health in aquaculture production systems, including: physiological stress related to the aquatic production system environment; 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 for efficiency and Reduced Environmental Impacts**

Novel or innovative approaches to improve existing or alternative production system design and management strategies including development of biological, engineering and systems through aeration, flow patterns, etc.; characterization, handling and treatment of effluent from aquaculture production systems; improved harvesting methods and strategies; and improved operating efficiencies for recirculation systems.

### **5. Algal Production Systems**

Novel or innovative approaches to improve the efficiency of algal production and feedstock logistics including identification of new (or improved) species with improved nutritional profile for use in aquaculture feed, human food, or food supplements; development of improved bioreactor technology; and development of new methods for harvesting algal biomass.

### **Other Key Information**

1. Applicants are strongly encouraged to contact the NPL regarding the suitability of research topics.
2. For aquaponics, unless the focus is on developing significant technological improvements, proposals that deal with applying current aquaponics technology should be submitted to 8.12 Small and Mid-Size Farms
3. 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.
4. Applications that deal with biomass conversion or development of new products from algae should be submitted to the 8.8 Biofuels and Biobased Products topic area.

### **Biofuels and Biobased Products-Topic Area 8.8**

**Contact Dr. David Songstad, NPL for SBIR/STTR Biofuels and Biobased Products at [David.Songstad@usda.gov](mailto:David.Songstad@usda.gov) or (816) 412-7422** regarding questions about the suitability of research topics or to arrange a telephone consultation.

The objective of this topic area is to promote the use of non-food biobased products and biofuels by developing new or improved technologies that will lead to increased competitiveness of value-added 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. Historically, appropriate research areas have included: development of improved technology for converting agriculturally derived raw materials into useful industrial products; development of new products from new industrial crops; and improving the effectiveness or cost-competitiveness of industrial products derived from agricultural materials in comparison to non-agriculturally derived products.

### **Biofuels and Biobased Products Key Information**

Program Code: 8.8

Program Code Name: Biofuels and Biobased Products

Assistance Listing Number: 10.212

Project Type: Research

Grant Type: Standard

Application Deadline: FY 2023, 5 P.M. Eastern, October 25, 2022

Grant Duration: 8 Months SBIR/12 Months STTR

Anticipated Number of Awards: 7

Maximum Award Amount: \$175,000 or \$181,500 with TABA

### **Research Priorities:**

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

#### **1. New Non-food Biobased Products from New Industrial Crops**

Identification of markets and development of new biobased products and processes from new industrial crops or microbes. These products should be economically competitive and have environmental sustainability benefits compared to similar products on the market. Benefits also include optimizing carbon sequestration potential through carbon markets and other ecosystem services that may aid in climate change mitigation.

#### **2. New Processes for the Manufacture of Industrial Products, Chemicals, or Biofuels**

New processes for the production of biobased industrial products, chemicals, or biofuels that will be competitive with the cost and performance of equivalent petroleum-based products. Support for biofuel projects includes the sustainable conversion of crops and agricultural residues into biofuels (conventional, cellulosic, or advanced biofuels) or coproducts that will improve the economic feasibility of production of those biofuels. Technologies must seek to minimize adverse environmental impacts such as energy use, water use, harmful byproducts, and life cycle carbon emissions in comparison to incumbent products.

### **Other Key Information**

1. Applicants are strongly encouraged to contact the NPL regarding the suitability of research topics.
2. Applications that include software development or other data-intensive technologies are encouraged to apply for topics related to the Priority Research Areas listed above.
3. Applications that deal with developing value-added biofuels (including ethanol) and biobased products from forest biomass should be submitted to the 8.1 Forest and Related Resources topic area.

4. Applications that deal with developing biofuels and bioenergy that will improve the sustainability of small and mid-size farms should be submitted to the 8.12 Small and Mid- Size Farms topic area.
5. 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.
6. 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.
7. Applications that deal with the genetic improvement, production, or feedstock logistics of photosynthetic algae should be submitted to the 8.7 Aquaculture topic area.
8. 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.
9. Animal manure and carcass waste are considered acceptable feedstocks for applications to the 8.8 Biofuels and Biobased Products topic area.
10. Microbial approaches must demonstrate a credible path to industrially relevant conversion rates, yields, and titers.

### **Small and Mid-Size Farms-Topic Area 8.12**

**Contact Dr. Denis Ebodaghe, NPL for SBIR/STTR Small and Mid-size Farms at [Denis.Ebodaghe@usda.gov](mailto:Denis.Ebodaghe@usda.gov) or (202) 445-5460** regarding questions about the suitability of research topics or to arrange a telephone consultation.

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 \$350,000 for small farms and between \$350,000 and \$999,999 for mid-size farms – hereafter referred to as small farms). Small farms account for 90 percent of all U.S. farms 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. While some small farms are located in urban areas, most small farms are located in rural areas, and these farms are 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.

### **Small and Mid-Size Farms Key Information**

Program Code: 8.12

Program Code Name: Small and Mid-Size Farms Assistance Listing Number: 10.212

Project Type: Research Grant Type: Standard

Application Deadline: FY 2023, 5 P.M. Eastern, October 25, 2022

Grant Duration: 8 Months SBIR/12 Months STTR

Anticipated Number of Awards: 10

Maximum Award Amount: \$125,000 or \$131,500 with TABA

**Research Priorities:**

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

**1. New Agricultural Enterprises**

Develop new small scale agricultural enterprises focused on specialty farm products, both plant and animal, and enable innovative markets for these farm products through direct marketing (farmers markets or cooperatives with optimal financial return) or through specialty market outlets that offer a higher financial return.

**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. This includes 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**

Develop tools and skills that are appropriate for small farms that enhance the efficiency and profitability of small farms. New tools are also needed that enhance farm safety. Development of new risk management tools to facilitate better planning is needed. Development of improved farm level life-cycle assessment tools that help small to mid-sized farms 1) improve operations through resource efficiency and 2) quantify ecosystem services provided is needed. Innovative ways to promote agri-tourism as a way to enhance farm profitability is encouraged.

**4. On Farm Natural Resources, Renewable Energy, and Climate-Smart Agriculture**

Promote improved energy efficiency and conservation in farming operations through technologies and innovations that reduce operation costs, increase efficiency and increase profits while conserving natural resources and adapting to climate change. Particular emphasis is needed to develop better ways to utilize on farm renewable energy sources, such as wind, solar, and geothermal energy. Innovations should be scalable to multiple farm markets and not only focused on an individual farm.

**5. Urban Farming**

In recent years there has been increasing interest in the establishment of small farms in urban areas: on roof tops, in abandoned buildings and in vacant lots. Efforts are needed to explore ways to make urban farming, through methods such as vertical farming and controlled environment agriculture, more energy efficient, environmentally sustainable, and profitable. The most appropriate crops for urban farms need to be determined. Procedures that would increase the establishment of new urban farms need to be developed.



## **6. Post-Harvest Technology**

Preventing crop losses after harvest and minimizing food waste throughout the crop value-chain is important to the profitability of small and mid-size farms. A range of post-harvest technologies are needed in the areas of post-harvest pest management, stored product monitoring, crop drying, crop preservation, and grain conditioning are needed for both conventional and organic crop production practices used by small and mid-size growers. This also includes developing technologies and information systems that enable the integration of technologies for the tracking, documentation and marketing of farm products.

### **Other Key Information**

1. Applicants are strongly encouraged to contact the NPL regarding the suitability of research topics.
2. New Technologies and Innovations that address conservation of natural resources and renewable energy should be submitted to Topic Area 8.4 Conservation of National Resources.
3. For aquaponics, unless the focus is applying current aquaponics technology, proposals that deal with developing significant technological improvements should be submitted to 8.7 Aquaculture.

### **Plant Production and Protection (Engineering)-Topic Area 8.13**

**Contact Dr. Victoria Finkenstadt, NPL for SBIR/STTR Plant Production and Protection (Engineering) at [Victoria.Finkenstadt@usda.gov](mailto:Victoria.Finkenstadt@usda.gov) or (816) 520-8456 or Dr. Steven Thomson NPL for SBIR/STTR Plant Production and Protection (Engineering) at [Steven.J.Thomson@usda.gov](mailto:Steven.J.Thomson@usda.gov) or 816-908-3310** regarding questions about the suitability of research topics or to arrange a telephone consultation.

The objective of this topic area is to enhance crop production in both conventional and organic systems by creating and commercializing engineering technologies that enhance system efficiency and profitability and that protect crops from pests and pathogens in economically and environmentally sound ways. Engineering projects must describe the system need; design specifications, functionality and reliability; and cost benefit analysis. Where feasible, projects should describe the testing metrics, experimental design, and materials and methods to collect and analyze data on the metrics. Projects must create solutions that are scalable to address problems in commercial agriculture. Applications to the 8.13 topic area should focus on engineering solutions that directly improve crop production and protection. Applications proposing topics outside of crop production and protection should contact the NPL to ensure that that project is a fit in the program area. Applications for the Phase I program must address early stage, proof of concept research as is specified in this RFA. Adaptation of existing technologies to new crops, regions, pest, etc. must require significant innovation as to fit the proof-of-concept nature of the Phase I program.

## **Plant Production and Protection (Engineering) Key Information**

Program Code: 8.13

Program Code Name: Plant Production and Protection (Engineering)

Assistance Listing Number: 10.212

Project Type: Research Grant Type: Standard

Application Deadline: FY 2023, 5 P.M. Eastern, October 25, 2022

Grant Duration: 8 Months SBIR/12 Months STTR

Anticipated Number of Awards: 10

Maximum Award Amount: \$175,000 or \$181,500 with TABA

## **Research Priorities**

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 that optimize inputs and reduce operational costs.

Topics may include but are not limited to:

- a. Technologies that enhance commercial horticulture production.  
Projects to improve the competitiveness of U.S. commercial horticulture production including flowering potted plant, bedding plant, cut flower production, seasonal crops, annuals, and perennials.
- b. Production, harvesting, and postharvest handling of specialty crops.  
Projects to reduce manual labor needs, maintain or improve quality, improve handling, and reduce postharvest loss.
- c. Cyber-physical systems to support precision agriculture.  
Projects that accelerate the integration of cyber-physical systems into precision agriculture including methods, tools, hardware, and software components. Projects should focus on developing novel improvements compared to existing technologies.
- d. Controlled environment agriculture.  
Projects that develop crop management systems, greenhouse structures, and controlled environmental agriculture systems that promote energy conservation and efficiency, including the development of technology for the economic use of renewable energy resources. Projects should consider the optimal conditions required for plant production, not only the reduction of energy.
- e. Climate smart agriculture.  
Projects that provide technical solutions for monitoring, and management of greenhouse gases in agricultural production systems. Projects should focus on engineering methods, monitoring and decision support analysis to reduce greenhouse gas emissions.

### **2. Plant protection against abiotic and/or biotics stresses**

Reduce the impact of plant pathogens, insect pests, weeds, and abiotic stresses on crop plants.

Topics may include but are not limited to:

- a. Improved chemical application technology.  
Projects that increase product efficacy, worker safety, and reduce off-target drift of applied chemicals.
- b. Monitoring, detection, and management.

Projects that provide technical solutions for monitoring, detection, and management of pests and abiotic stresses, such as those caused by climate change, at the earliest stage of their manifestation. Projects on diagnostics, decision support systems, and machine-assisted detection of plant pathogens and pests submitted to this area should focus on engineering methods, decision support analysis, and diagnostic output leading to mitigation of abiotic and biotic stresses. Projects should address known or emerging abiotic or biotic stresses that are reducing yields in commercial systems.

### **3. Pollinators and crop production**

Engineering technologies that address the health and success of domesticated and natural pollinators of economically important crops. Topics may include but are not limited to:

- a. Incorporation of native pollinator habitat, forage and nesting infrastructure in agroecosystems
- b. Decision support tools that map pollination needs and pollinator deficits for land use decisions
- c. Artificial systems (robotics) for improving pollination outcomes including AUVs
- d. New technologies for reducing commercial honeybee mortality during transportation and overwintering periods

### **Other Key Information**

1. Applicants are strongly encouraged to contact the NPL regarding the suitability of research topics.
2. Applications that deal with the feedstock logistics of woody biomass (including short rotation crops like willow and poplar) or rangeland and grassland management should be submitted to the 8.1 Forest and Related Resources topic area.
3. Applications that deal with genetic engineering for improved crop production and protection should be submitted to 8.2 Plant Production and Protection – Biology.
4. Applications that deal with irrigation technology and decision support for irrigation should be submitted to 8.4 Conservation of Natural Resources topic area.
5. Applications that deal with the production of algae for biofuel production should be submitted to the 8.7 Aquaculture topic area.

**Comparison of Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs**

<b>Elements</b>	<b>SBIR</b>	<b>STTR</b>
Applicant	Small Business	Small Business
Award Size	\$125,000 or \$175,000 (PI) \$600,000 (PII)	\$125,000 or \$175,000 (PI) \$600,000 (PII)
Duration	8 months (PI) 24 months (PII)	12 months (PI) 24 months (PII)
% of Department's Extramural R&D Budget [FY22]	3.20%	0.45%
Formal Cooperative Agreement Required Outlining Intellectual Property Rights	No	Yes
Nonprofit Research Institution or Federally Funded Research and Development Center Participation Required	No	Yes
% Participation of Nonprofit Research Institution or Federally Funded Research and Development Center	33% or less (Phase I) Less than 50% (Phase II)	30 to 60% (Phase I and Phase II)
PI/PD Employment	Small Business	Small Business or Research Institution

## PART II. AWARD INFORMATION

### A. Available Funding

The anticipated amount available for Small Business Innovation Research Program Phase I is \$13,000,000 for FY 2023 grants. The anticipated amount available for Small Business Technology Transfer Program Phase I FY 2023 is \$2,500,000. USDA is not committed to fund any particular application or to make a specific number of awards. The [Automated Standard Application for Payments](#), operated by the Department of Treasury, Bureau of Fiscal Service, is the designated payment system for awards resulting from this RFA.

The current authorization for the SBIR/STTR programs expire on September 30, 2022. The 2023 RFA is being released prior to the passage of the program being reauthorized. Enactment of reauthorizing legislation is needed by September 30, 2022, in order for NIFA to implement the programs and make awards for fiscal year 2023.

This RFA is released prior to the passage of an appropriations act for FY 2023. Enactment of additional continuing resolutions or an appropriations act may affect the availability or level of funding for these programs.

### B. Application Restrictions

NIFA will evaluate applications using the criteria described in [Part V](#) of this RFA. Applications for FY 2023 are limited to the following application types: (Include all that apply)

1. *New application*: New applications will be evaluated using the criteria described in [Part V](#) of this RFA and are subject to the due dates herein (see [Appendix III](#) for definition).
2. *Resubmitted application*: Resubmitted applications must include the response to the previous review panel summary and are subject to the same criteria and due dates herein. Resubmitted applicants must enter the NIFA-assigned proposal number of the previously submitted application in the *Federal Field (Field 4)* on the application form (see [Appendix III](#) for definition).
3. *Renewal application*. Renewal applications must contain the same information as required for new applications and must contain a *progress report*. Renewal applications are subject to the same criteria and due dates herein. Applicants submitting a renewal application must enter the NIFA-assigned proposal number of the previously approved application in the *Federal Field (Field 4)* on the application form (see [Appendix III](#) for definition).
4. *Resubmitted renewal application*. Resubmitted renewal applicants must provide a *progress report*, respond to the previous review's panel summary, and are subject to the same criteria and due dates herein. The progress report must include the implementation of the data management plan (DMP) of the previously funded project. Applicants submitting a renewal application must enter the NIFA-assigned proposal number of the previously approved application in the *Federal Field (Field 4)* on the application form (see [Appendix III](#) for definition).

### C. Project and Grant Types

Phase I applications may not request more than maximum award amount listed for the topic area being applied to, for a period not to exceed 8 months for SBIR or 12 months for STTR. The planned periods of performance dates are listed below, however these dates may change due to enactment of continuing resolutions or an appropriations act:

FY 2023: For SBIR: July 1, 2023 through February 28, 2024

FY 2023: For STTR: July 1, 2023 through June 30, 2024

**D. Ethical Conduct of Funded Projects**

In accordance with [§ 2, 3, and 8 of 2 CFR Part 422](#), institutions that conduct USDA-funded extramural research must foster an atmosphere conducive to research integrity, bear primary responsibility for prevention and detection of research misconduct, and maintain and effectively communicate and train their staff regarding policies and procedures. In the event an application to NIFA results in an award, the Authorized Representative (AR) assures, through acceptance of the award that the institution will comply with the above requirements. Award recipients must, upon request, make available to NIFA the policies, procedures, and documentation to support the conduct of the training. See [Responsible and Ethical Conduct of Research](#) for further information.

## PART III. ELIGIBILITY INFORMATION

### A. Eligibility Requirements

Applicants for the SBIR/STTR Phase I must meet all the requirements discussed in this RFA. Failure to meet the eligibility criteria by the application deadline may result in exclusion from consideration or, preclude NIFA from making an award. For those new to Federal financial assistance, [NIFA's Grants Overview](#) provides highly recommended information about grants and other resources to help understand the Federal awards process.

Each applicant submitting an application must qualify as a Small Business Concern (SBC) through registration with the SBA for R/R&D purposes at the time of selection (see definitions in section Part VIII). Failure to meet an eligibility criterion by the application deadline may result in the application being excluded from consideration or, even though an application may be reviewed, will preclude NIFA from making an award.

A potential grantee that is a subsidiary must show that the parent company or parent companies are also a small business entity, and the parent company or parent companies must provide documentation supporting their small business status (the documentation should be included in, Other Attachments, of the Research and Related (R&R) Other Project Information form as directed by Part IV of this RFA). If the parent company or one of the parent companies is a nonprofit organization, then the subsidiary is not eligible to submit an SBIR/STTR application.

For SBIR, the primary employment of the Project Director/Principal Investigator (PD/PI) must be with the small business concern at the time of award and during the conduct of the proposed research. Eligible primary employment means that more than one-half (51%) of the PD's/PI's time is spent in the employ of the small business during the award period of performance. Primary employment with the small business precludes the applicant as a full-time employee with another organization or academic institution. While the PD/PI must work more than one-half (51%) of his/her time for the small business during the entire grant period, there is no time requirement for the PD's/PI's work on the proposed research. Prior Federal Employees must provide documentation that post termination requirements from Federal Service has been completed at time of submission.

For STTR, the PD/PI for the proposed project (or, if multiple PD/PIs, at least one PD/PI) must be employed by and perform more than one half (51%) of the PD/PDs time in the employ of either the small business concern or the partnering nonprofit Research Institution. For projects with multiple PD/PIs, at least one PD/PI must meet the primary employment requirement. That PD/PI will serve as the contact PD/PI for the Project Team. To apply to both the SBIR and STTR programs, the PD/PI must be employed more than one-half (51%) by the Small Business Concern.

#### 1. Size

An SBIR/STTR awardee, combined with its affiliates, must not have more than 500 employees. The small business concern must be the primary performer of the proposed research effort. For SBIR Phase I, a minimum of two-thirds (66%) of the research or analytical work, as determined by budget expenditures, must be **performed by the proposing small business concern**. For STTR Phase I, as determined by budget

expenditures, a minimum of 30% and a maximum of 60% of the research or analytical work must be **performed by a single nonprofit research institution (e.g., University, Federal Laboratory, etc.)**. To apply to both the SBIR and STTR programs, at least 30% but not more than 33% of the research must be conducted by a single nonprofit research institution (e.g., University, Federal Laboratory, etc.)

## **2. Work in the United States**

For Phase I, the R/R&D work must be performed in the United States. On rare and unique circumstances, for example, a supply, material or project requirement may not be available in the United States, agencies may allow that particular portion of the R/R&D work to be performed or obtained outside of the United States. Upon award, the Phase I awardee may request an exception as described in the award terms and conditions and submit to USDA NIFA for approval.

## **3. Benchmark**

Any company that has received at least 20 Phase I awards, regardless of the awarding agency, during the five-year period (Fiscal Year 2016 through 2021) must have received a minimum of five Phase II awards (25% conversion rate), regardless of the awarding agency, over the same five-year period to be eligible to submit a Phase I application in response to this solicitation. If a company has not received an SBIR/STTR award or has received less than 20 SBIR/STTR awards, this benchmark requirement does not apply.

**Duplicate or Multiple Submissions** – Duplicate submissions of the same application to more than one topic area is not allowed. Multiple, distinctive proposals may be submitted in the same grant year. For those new to Federal financial assistance, NIFA’s [Grants Overview](#) provides highly recommended information about grants and other resources to help understand the Federal awards process.

### **B. STTR Partnering Nonprofit Research Institution Eligibility Criteria**

Must be located in the United States and meet one of three definitions 1) Nonprofit college or university, 2) Domestic nonprofit research organization, or 3) Federally funded R&D center (FFRDC).

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

**No Match Required** - The SBIR/STTR Phase I has *no matching requirement*. NIFA will not factor matching resources into the review process as an evaluation criterion.



## PART IV. APPLICATION AND SUBMISSION

### A. Method of Application

Applicants must apply to this RFA electronically; no other method or response is accepted. The electronic application for this RFA and additional resources are available on [Grants.gov](https://www.grants.gov) and [Grants 101](#). See **Steps to Obtain Application Materials** for instructions on how to obtain an electronic application. **Part III.500; Page 14** of the [NIFA Grants Application Guide](#) (Application Guide) contains detailed information regarding the [Grants.gov](https://www.grants.gov) registration process.

### Steps to Obtain Application Materials

**Step One: Register:** New Users to [Grants.gov](https://www.grants.gov) must register early with [Grants.gov](https://www.grants.gov) prior to submitting an application ([Register Here](#)).

**Step Two:** Download Adobe. Download and Install [Adobe Reader](#) (see [Adobe Software Compatibility](#) for basic system requirements).

**Step Three:** Find Application. Using this funding opportunity number [USDA-NIFA-SBIR-009301](#), search for application here: [Opportunity Package](#).

**Step Four:** Assess Readiness. Contact an AR prior to starting an application to assess the organization's readiness to submit an electronic application.

### 2) Help and Resources

#### a) Grants.gov Support

[Grants.gov Online Support](#)

**Telephone support:** 800-518-4726 Toll-Free or 606-545-5035

**Email support:** [support@grants.gov](mailto:support@grants.gov)

**Self-service customer-based support:** [Grants.gov iPortal](#)

**Key Information:** Customer service business Hours 24/7, except [federal holidays](#).

#### b) NIFA Support

**Email:** [grantapplicationquestions@usda.gov](mailto:grantapplicationquestions@usda.gov)

**Key Information:** Business hours: Monday thru Friday, 7a.m.-5p.m. ET, except [federal holidays](#).

### B. Content and Form of the Application

The [Application Guide](#) is part of the corresponding application package for this RFA. The RFA overrides the [Application Guide](#) if there is a discrepancy between the two documents. NIFA will accept subsequent submissions to an application until the application deadline. However, applicants that do not meet the application requirements, to include partial applications, risk being excluded from NIFA's review. NIFA will assign a proposal number to all applications that meet the requirements of this RFA. Applicants must refer to the proposal number when corresponding with NIFA. **Key Application Instructions** outlines other key instructions for applicants.

## Key Application Instructions

All references are to the [Application Guide](#);

- a) Attachments must be in a portable document format (PDF) format. **(Part IV.200; Page 18)**
- b) Check the manifest of submitted files to verify attachments are in the correct format. **(Part VI.100 Option 2; Page 81)**
- c) Conduct an administrative review of the application before submission. **(Part VII)**
- d) Follow the submission instructions. **(Part IV.300; Page 19)**
- e) Provide an accurate email address, where designated, on the SF-424 R&R. **(Part V.100 Field 5; Page 25)**
- f) Contact the [Grants.gov](https://www.grants.gov) helpdesk for technical support and keep a record of the correspondence.
- g) Contact NIFA if applicant does not receive correspondence from NIFA regarding an application within 30 days of the application deadline.

Note the attachment requirements (e.g., PDF) in Part IV.200; Page 18 of the [Application Guide](#). *Any proposals that are non-compliant with the requirements (e.g., content format, PDF file format, file name restrictions, and no password protected files) will be at risk of being excluded from the NIFA review.* Grants.gov does not check for NIFA required attachments or whether attachments are in PDF format; see Part VI.100 Option 2; Page 81 of the [Application Guide](#) for how to check the manifest of submitted files. Partial applications will be excluded from NIFA review.

For any questions related to the preparation of an application, review the NIFA Grants.gov [Application Guide](#) and the applicable RFA. If assistance is still needed for preparing application forms content, contact:

1. Email: [sbir@usda.gov](mailto:sbir@usda.gov)
2. Business hours: Monday through Friday, 7 a.m.-5 p.m. CST, excluding federal holidays.

Phase I applications must address only scientific research activities that leads to a commercialized innovation. A small business must not propose technical assistance for the following:

1. Demonstration projects
2. Classified research
3. Large equipment purchases including vehicles and farm equipment
4. Construction or purchase of infrastructure, buildings or real property
5. Financial assistance to start or create a company
6. Patent applications

Many of the research projects supported by the SBIR/STTR programs lead to the development of new marketable innovations 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.

Phase I applications must also describe the market opportunity of the innovation being researched under Phase I ([Application Guide](#) Part V.120, Field 8. Project Narrative; Page 42). Applications that deal principally with developing proven concepts for commercial markets or scaling up previously developed prototypes for commercial production should not be submitted unless the concepts align with topic areas 8.6: Rural and Community Development and/or 8.12: Small and Mid-Sized Farms. Efforts that are aligned with developing proven concepts for commercial markets or scaling up previously developed prototypes are considered the responsibility of the private sector and therefore are not supported by USDA NIFA unless these are submitted to topic areas 8.6 and 8.12. An application must be limited to only one research problem.

Literature surveys should be completed prior to the Phase I application and should not be proposed as part of the R&D effort.

Applicants may respond to any of the topic areas listed under RFA Part I, § C. SBIR/STTR Phase I topic areas. Applications may be submitted to both SBIR and STTR within the same topic area if the proposed project aligns with the regulations for both programs (e.g., percentage of work conducted by the nonprofit research institution is at least 30% but less than 33%, the PD/PI works more than one-half (51%) of the time with the small business, etc.). However, the same application, may not be submitted under more than one topic area. Organizations may 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 NIFA SBIR/STTR professional staff that the proposed research is a sound approach to an important scientific question and is worthy of support under the stated USDA NIFA evaluation criteria. 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.

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 NIFA SBIR/STTR programs 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@usda.gov](mailto:sbir@usda.gov) of the resubmission. Submitting changes to Grants.gov without contacting the program contact could significantly delay your application submission and may result in the application not being reviewed.

**SF 424 R&R Cover Sheet.** See **Part V.100; Page 23** and **Part V.1001 Field 17; Page 31** of the [Application Guide](#) for the required certifications and assurances.

**SF 424 R&R Project/Performance Site Location(s).** See **Part V.110; Page 34** of the [Application Guide](#).

**R&R Other Project Information Form.** See **Part V.120; Page 36** of the [Application Guide](#).

1. Field 7. Project Summary (PS)/Abstract. The PS must show how the project goals align with the project goals of the SBIR/STTR Phase I Program. See **Part V.120 § 3 Field 7; Page 41** of the [Application Guide](#) for instructions and suggested templates. The PS is limited to one page with line spacing set at single space (or not exceeding six lines of text per vertical inch) and at least 1-inch margins with font size no smaller than 12-point Times New Roman.

The PS must include a description of the problem or opportunity, project objectives, and a description of the effort. The PS must also include a paragraph discussing the anticipated results and potential commercial applications of the proposed research. NIFA may publish the PS of successful applications; therefore, the PS should not contain proprietary information.

It is the responsibility of the applicant to review the attachment for page limit and PDF compliance before submission. Applicants must ensure that the abstract attachment meets the required page limit. NIFA will not review applications that exceed the required page limits.

2. Field 8. Project Narrative (PN). The PN must not exceed 17 pages of written text including all figures and tables with line spacing set at 1.5 and at least 1-inch margins with font size no smaller than 12-point Times New Roman (the font size for tables and figures should be no smaller than 11 points, Times New Roman). The only exception to the page limit requirement will be found in the directions as noted below under (a) Response to Previous Review. The page limits outlined here ensure fair and equitable competition. Appendices to the PN are allowed if they are directly germane to the proposed project. Do not add appendices to circumvent the page limit. Applicants must not include additional information such as cover sheets, table of contents, reference listings, budgets, and appendices unless the applicant intends for NIFA to consider them in the page limit. The PN must include all of the following:
  - a. Response to Previous Review. The response to previous review must not exceed 1 page with line spacing set at 1.5 and at least 1-inch margins with font size no smaller than 12-point Times New Roman. This does not count towards the page limit for the PN.
  - b. Responsiveness to USDA NIFA SBIR/STTR Program Priorities- Please indicate if the application has a connection to agriculturally related manufacturing technology, energy efficiency and alternative and renewable energy. Provide a brief explanation of how the application is related to the area indicated.
  - c. Identification and Significance of the Problem or Opportunity- Clearly state the specific technical problem or opportunity addressed and its importance.

- d. Background and Rationale- Indicate the overall background, technical approach and market needs to the problem or opportunity being pursued. This must include a statement of end-user needs. Describe how the proposed research plays a part in providing needed results. As a part of this section, it is critical that applications adequately cite relevant scientific literature to demonstrate support for your proposed research. Moreover, all citations provided must be properly referenced in the Bibliography & References Cited as a separate attachment (see Field 9). USDA NIFA has the right to decline any application where there is evidence of plagiarism.
- e. Relationship with Research or Research and Development- – Discuss the significance of the Phase I effort in providing a foundation for the follow-on Phase II 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.
- f. 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.
- g. 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 and can include graphics, tables, charts, etc...
- h. 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. Describe any commercial products, services or innovations that are already in the market and if the project relates back to that R&D. Discussion of existing innovations in the application should convince reviewers that the applicant is aware of related research and commercial innovations 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 innovation or to substantial improvement of an existing product, process, service, or technology.
- i. The Market Opportunity- Describe the market and addressable market for the innovation. Discuss the business economics and market drivers in the target industry. How has the market opportunity been validated? Describe your customers and your basic go to market strategy to achieve the market opportunity. Describe the competition. How do you expect the competitive landscape may change by the time your product/service enters the market? What are the key risks in bringing your innovation to market? Describe your commercialization approach. Discuss the potential economic benefits associated with your innovation, and provide estimates

of the revenue potential, detailing your underlying assumptions. Describe the resources you expect will be needed to implement your commercialization approach.

3. Field 9, Bibliography & Cited References. 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.
4. Field 10, Facilities & Other Resources. Describe the types, location, and availability of instrumentation and physical facilities necessary to carry out the work proposed. If the work will be conducted at a facility not owned and operated by the applicant, see Field 12 for additional information.
5. Field 11, Equipment Documentation. 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/STTR funding agreement, the small business should purchase only American-made items whenever possible.
6. Field 12, Add Other Attachments. See **Part V.120 Field 12; Page 43** of the [Application Guide](#) for instructions regarding mandatory Felony Convictions or Tax Delinquent Status. The following are additional instructions for documentation that may be required for your application.
  - a. 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.
  - b. 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 businesses that have not previously received Federal research awards.
    - i. For STTR, involvement with a nonprofit research institution (e.g., Universities, Federal Laboratories) **is required**. A single nonprofit research institution must perform a minimum of 30% and a maximum of 60% of the work. For STTR, the small business and the nonprofit research institution are **required** to include a formal cooperative agreement detailing the allocation of intellectual property rights to carry out follow-on research, development, or commercialization activities.
    - ii. 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. For SBIR, up to a *maximum* of one-third (33%) of the

grant based on expenditures can be used for outside services. For STTR, a *minimum* of 30% and a *maximum* of 60% of the grant based on expenditures must be used for outside services. 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.

- c. Letters of Support – Letters of Support are strongly encouraged and should be included. Letters of support act as an indication of market validation and technical support for the proposed innovation and add significant credibility to the proposed effort. Letters of support should demonstrate that the company has initiated dialogue with relevant stakeholders (potential customers or end users, strategic partners or investors) for the proposed innovation and that a legitimate business opportunity may exist should the technology prove feasible. The letter(s) must contain affiliation and contact information for the signatory stakeholder. Letter of support from consultants or subcontractors may be provided if they are providing a critical role in the project, such as access to facilities, equipment or expertise. The recommended page limit for each individual letter is two pages. Letters and supporting documents from State, Local and Congressional representatives, are NOT considered letters of support and should not be submitted as part of the application. Applicants must include these letters of support in a PDF format and upload to Field 12 of the R&R Other Project Information form (Add Other Attachments).

If letters of support are not appropriate for this stage of an innovation, due to business considerations, then the applicant must clearly justify why letters of support are not being included in a two-page document and include this in a PDF format and upload to Field 12 of the R&R Other Project Information form (Add Other Attachments).

The justification should relate to the technical and commercial considerations of the innovation proposed in the application.

- d. Duration Exceeds Normal Project Period – The proposed duration of Phase I projects should normally not exceed eight (8) months for SBIR and twelve (12) months for STTR, except in special, justified circumstances. Where a proposed research project requires more than the specified duration to complete Phase I, a longer project period, not to exceed twenty (20) months, may be requested. An applicant of a Phase I project with an anticipated duration beyond eight months for SBIR and twelve months for STTR should specify and justify the length of duration in the application at the time of its submission to USDA NIFA.
- e. Applicant is a Subsidiary – A potential grantee that is a subsidiary must show that the parent company or parent companies are also a small business entity, and the parent company or parent companies must provide documentation supporting their small business status. The parent company or companies must reside in the U.S. and cannot be a nonprofit. The subsidiary must provide documentation to support its independent viable financial status.

- f. 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.
- g. Non-Domestic Performance Explanation – 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. All Applicants MUST note that per the terms and conditions of the award “All foreign travel performed under this project must be approved in writing by USDA NIFA prior to departure. If foreign travel is authorized under this project, the approved budget will identify funds for this purpose. Where foreign travel is contemplated subsequent to the effective date of the project, a written request must be submitted to the USDA NIFA outlining the purpose of the proposed trip, the inclusive dates of travel, the destination, and estimated costs involved.”

**R&R Senior/Key Person Profile (Expanded).** See **Part V.130; Page 44** of the [Application Guide](#) for profile requirements, details about the biographical sketch, and suggested support templates.

**R&R Personal Data.** This information is voluntary and is not a precondition of award (see **Part V.140; Page 47** of the [Application Guide](#)).

**R&R Budget.** See **Part V.150; Page 47** of the [Application Guide](#).

A Research and Related Budget form must be completed for each year (or partial year) for which work is proposed under this program solicitation. 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.

1. Request for use of Technical and Business Assistance (TABAs): [15 U.S.C. § 638\(b\)](#) permits SBIR/STTR Phase I awardees to enter into agreements with one or more vendors to provide Technical and Business Assistance (TABAs). USDA is able to fund TABA assistance to all USDA SBIR/STTR Phase I grantees. Grant recipients have two options for receiving TABA assistance: (1) utilize services provided by a USDA vendor or (2) identify their own TABA assistance provider.

If you wish to receive TABA assistance from USDA’s vendor, Larta Institute, you do not need to include this expense in your budget. If you are awarded a Phase I grant, you will receive notification from USDA and follow-up contact from Larta on what services are available to you and how to obtain these services at no cost to your small business. If you wish to utilize your own TABA assistance provider, you are required to include this as “Other Direct Costs” in your budget, provide a detailed budget justification, and a signed letter of commitment from the provider. You may include up to \$6,500 for assistance. Please note that this commercialization assistance does not count toward the maximum grant size of \$125,000 or \$175,000. For example, seeking commercialization assistance from your own provider could result in an increase of \$6,500 over the maximum grant limit. That is under this RFA with a maximum grant limit of \$125,000, the actual grant may increase to \$131,500 respectively. Reimbursement is limited to



services received that comply with [15 U.S.C. § 638\(b\)](#). In the event some or the entire amount listed is not expended on commercialization assistance services as proposed, the remaining funds cannot be budgeted to other project costs and will be provided back to USDA. Re-budgeting of these funds is not allowable.

Applicants must request a federal budget that is reasonable and must not exceed a ceiling of \$125,000 or \$131,500 if requesting TABA assistance from your own vendor, for areas 8.6 and 8.12. For all other topic areas (8.1, 8.2, 8.3, 8.4, 8.5, 8.7, 8.8, and 8.13) the budget must not exceed \$175,000 or \$181,500 if requesting TABA assistance from your own vendor.

2. Fee - A reasonable fee, not to exceed seven percent of total Federal funds awarded (.07527 of Field I, Total Direct and 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 NIFA. If a fee is requested, the amount should be indicated in Field J “Fee” on the R&R Budget form. 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. Proposals with budgets exceeding \$125,000 (\$131,500 with TABA) or \$175,000 (\$181,500 with TABA) will be returned without review.
3. Indirect costs (IDC) – See [Part IV § C](#) of this RFA for funding restrictions regarding indirect cost, and [Part V.150 Section H; Page 57](#) of the [Application Guide](#) for additional information. There are three options for charging indirect costs: 1) obtain a negotiated indirect cost rate agreement (NICRA) from your Cognizant Agency; 2) elect to use the 10% De Minimis Rate; or 3) charge all allowable facilities and administrative costs under the project as direct costs. Billing rates are not allowed.

**Data Management Plan.** A Data Management Plan is NOT required for this program.

**Supplemental Information Form.** See [Part V.300; Page 74](#) of the [Application Guide](#).

1. Field 2. Program to which the applicant is applying. Enter the program name, for example, “Animal Production and Protection” and the corresponding program code, “8.3”. Accurate entry is critical.

If you have a question about which topic area is appropriate for your application, please contact the National Program Leader (NPL) 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 Part I, § C of this 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.

2. Field 8. Conflict of Interest List. See [Part V.300; Page 76](#) of the [Application Guide](#).

**Representations Regarding Felony Conviction and Tax Delinquent Status for Corporate Applicants.** This is required for corporate applicants. See [Part V.200; Page 66](#) of the

[Application Guide](#) for a description of the term, “corporation.”

### **SBIR/STTR Information**

Information related to the questions on this form is dealt with in detail in Part V.220; Page 69 of the [Application Guide](#) unless otherwise noted below.

SBC Control ID – Please enter your Small Business Concern number that you received upon registering at <https://www.sbir.gov/registration>.

Program Type – Select SBIR, STTR, or Both. Applications may be submitted to both SBIR and STTR within the same topic area if the proposed project aligns with the regulations for both programs (e.g., percentage of work conducted by a single nonprofit research institution is at least 30% but less than 33%, the PD/PI works more than one half (51%) of the time with the small business, etc.).

Application Type – Select Phase I.

Letter of Intent Number – This solicitation does not require a letter of intent. Enter “NA”.

1. Field 7. Commercialization Plan – Leave this section blank.
2. Field 8. Documentation of Prior SBIR/STTR Phase II Awards – There are two documents Phase I applicants must provide.

Attachment 1: A small business firm that submits a Phase I application and has received more than 15 Phase II SBIR/STTR 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/STTR 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 NIFA shall collect and retain the information at least until the General Accounting Office submits the report required under § 105 of the Small Business Research and Development Enhancement Act of 1992.

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

Attachment 2: Five (5) Page Limit.

A small business firm that submits a Phase I application and has previously received Phase II funding under the USDA NIFA SBIR/STTR Programs must document the extent to which it was able to secure Phase III funding and commercialize the technology, product or service funded by USDA NIFA SBIR/STTR. The documentation must include:

1. Business Name
2. Year Company was founded
3. Identify and name change your business has gone through with the past five years
4. List the parent company if you were a subsidiary or a spin-off

5. Percentage of company revenues for each of the past three (3) fiscal years from federal SBIR/STTR funding (include Phase I and Phase II awards).
6. Phase II Grant Information
7. Partnership-Related Activities
8. Funding: Describe any funding and third-party investments
9. Revenue & Sales that were directly attributed to the prior Phase II SBIR/STTR awards.
10. Intellectual Property Assets
11. Other Success Indicators (Employees, Acquisitions, Return on Investment (ROI), etc.)
12. Company Achievements

If the applicant has not received Phase II funding, the applicant must provide an attachment stating, “No prior USDA NIFA SBIR/STTR Phase II awards have been issued to [Insert Company Name]”.

USDA NIFA SBIR/STTR shall collect and retain the information for its internal use. Any data provided under this section of the application may lead to USDA NIFA contacting the applicant to coordinate the development of additional information that can serve to inform the public and the Federal Government on the benefits of the USDA NIFA SBIR/STTR programs to Small Businesses.

### **C. Funding Restrictions**

#### ***Indirect Costs***

There are three options for dealing with indirect costs: 1) Obtain a negotiated indirect cost rate agreement (NICRA) from your Cognizant Agency; 2) Elect to use the 10% De Minimis Rate; or 3) charge all allowable facilities and administrative expenses as direct costs. Billing rates are not allowed.

***Fully negotiated rate.*** Applicants may request full indirect costs on total grant funds (Federal and match), subject to statutory limitations. In order to do so, the applicant must use the current negotiated indirect cost rate established by its cognizant Federal agency (the agency that provides the most funds). If awarded, the applicant will be required to produce a negotiated indirect cost rate agreement from the cognizant agency in order to recover indirect costs. Violation of cost accounting principles is not permitted when re- budgeting or charging costs to awards. Rather, costs must be consistently charged as either indirect or direct costs.

If the applicant wants full IDC (Indirect Cost Rate), but does not have a negotiated rate, and NIFA is the cognizant agency, the applicant must calculate an IDC rate in order to request IDC. Applicants are not required to complete the IDC package during the application process. Applicants need only to calculate an IDC rate to serve as a basis for requesting IDC, please see [National Institute of Food and Agriculture \(usda.gov\)](http://www.usda.gov) for additional resources. If awarded, the applicant will be required to submit a complete IDC proposal package in order to obtain a negotiated rate.

Organizations that do not have a current negotiated (including provisional) rate, may elect the De Minimis rate ([2 CFR 200.414](http://www.usda.gov)). The Uniform Guidance offers the option of electing to charge a de Minimis rate of 10 percent of modified total indirect costs (MTDC) which may be used

indefinitely. As described above and in [2 CFR 200.403](#), costs must be charged consistently as either indirect or direct costs but may not be double charged or inconsistently charged as both. If elected, this methodology must be used consistently for all Federal awards until such time as a non-Federal entity chooses to negotiate for a rate, which it may do at any time.

Successful applicants must not use grant funds awarded under the authority of this RFA to renovate or refurbish research, education, or extension space; purchase or install fixed equipment in such space; or to plan, repair, rehabilitate, acquire, or construct buildings or facilities.

#### **D. Submission Dates and Times**

We recommend that you conduct an administrative review of the application before submission of it via Grants.gov to ensure that it complies with all preparation instructions including page limits and pdf format.

Instructions for submitting an application are included in Part IV.300; Page 19 of the [Application Guide](#).

Applications for FY2023 must be received by Grants.gov by 5 p.m. Eastern Time on October 25, 2022. Applications received after this deadline WILL NOT be considered for review or funding.

If you have trouble submitting an application to Grants.gov, you should FIRST contact the Grants.gov Help Desk to resolve any problems. Keep a record of any such correspondence. See Part IV., A for Grants.gov contact information.

Applicants must allow additional time for electronic submission and plan ahead to allow time for correction of technical errors identified by Grants.gov. It is recommended that applicants begin submitting their completed application at least one day prior to the deadline. The USDA NIFA SBIR/STTR Programs will rarely accept late applications. Exceptions are only made for delays due to natural disasters or technical problems experienced by Grants.gov that impacts the entire applicant community. Documentation of the problem will be required. Exceptions made for technical problems will be for Grants.gov system failures prior to the deadline that impacts the entire applicant community. Applicants who have problems with their submissions to Grants.gov must call the Grants.gov help desk to resolve the problems and 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 SAM and Dunn and Bradstreet during the registration process

Once the application is successfully submitted to Grants.gov the applicant must forward the information above via email to [sbir@usda.gov](mailto:sbir@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 that impacted the entire applicant community 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.

We send email correspondence to the AR regarding the status of submitted applications. We

strongly encourage you to provide accurate email addresses, where designated, on the SF-424 R&R Application for Federal Assistance.

If the AR has not received correspondence from NIFA regarding a submitted application within 30 days of the established deadline, contact [sbir@usda.gov](mailto:sbir@usda.gov) and request the application number that was assigned to the application. Failure to do so may result in the application not being considered for funding by the peer review panel. Once the application has been assigned an application number, you should cite this number on all future correspondence.

It is anticipated that the evaluation of SBIR/STTR Phase I applications will require approximately six months from submission deadline, 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 via email within approximately 6 months after the submission deadline.

## **PART V. APPLICATION REVIEW REQUIREMENTS**

### **A. NIFA's Evaluation Process**

NIFA evaluates each application in a two-part process. First, we screen each application to ensure that it meets the administrative requirements set forth in this RFA. All administrative requirements must be met in order for the application to proceed to the next level of review. Second, a scientific peer-review process will be used to technically evaluate applications that have met the administrative requirements using a review panel (see [NIFA Peer Review Process](#)).

#### **Scientific Peer Review Process:**

NIFA selects reviewers for the review panel based upon their training and experience in relevant scientific, extension, or education fields, taking into account the following factors:

1. the level of relevant formal scientific, technical education, or extension experience of the individual, as well as the extent to which an individual is engaged in relevant research, education, or extension activities;
2. the need to include experts from various areas of specialization within relevant scientific, education, or extension fields;
3. the need to include other experts (e.g., producers, range or forest managers/operators, and consumers) who can assess the relevance of the applications to targeted audiences and program needs;
4. the need to include experts from a variety of organizational types (e.g., colleges, universities, industry, state and Federal agencies, and private profit and non-profit organizations) and geographic locations;
5. the need to maintain a balanced composition with regard to minority and female representation and equitable age distribution; and
6. the need to include reviewers who can judge the practical effective usefulness of each application to producers and the general public.

After each peer review panel has completed its deliberations, the responsible program staff of NIFA will recommend that your project is either approved for support from currently available funds or declined due to insufficient funds or unfavorable review.

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

After the review process has been completed, NIFA sends copies of reviews, *not* including the reviewers' identity, and a summary (if applicable) of the review panel comments to the PD.

***Conflicts of interest.*** NIFA takes extreme care to prevent any actual or perceived conflicts of interest that may influence the review or evaluation (see [NIFA Peer Review Process for Competitive Grant Applications](#)).

## **B. Evaluation Criteria**

NIFA anticipates that the evaluation of SBIR/STTR Phase I applications will require approximately six months from submission deadline. No information on application status will be available until NIFA makes the final selections. NIFA will notify both successful and unsuccessful applicants of final award decisions via email. For information about the status of a submitted application, see Part VI.100; Page 81 of the [Application Guide](#).

Applicants should be aware that applications that do not satisfy all the screening criteria will be returned to the proposing entity without 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 and have received an SBC Control Number. USDA NIFA uses the Small Business Administration (SBA) SBIR/STTR company registry certification that the applicant is to provide with the application to confirm the applicant is a small business concern.
- b. The application must meet the Application Content and Format requirements as described in this RFA. This includes page length requirements, all required forms and all files in PDF.
- c. The proposed budget must be within the dollar ceiling identified in this RFA.
- d. The proposed Phase I project must fall within one of the USDA NIFA SBIR/STTR topic areas.
- e. An application must contain adequate scientific/technical and market opportunity information that clearly states the project plan and objectives. USDA NIFA reserves the right not to submit for review any application that it finds to have insufficient information

NIFA will use the following criteria to evaluate proposals submitted in response to this RFA that pass the screening criteria described above:

### **1. Phase I Scientific and Technical Feasibility**

- a. Project objectives and outcomes are clearly described, adequate, and appropriate. All project components (i.e., research and commercialization) are reflected in one or more project objectives;
- b. Proposed approach, procedures, or methodologies are innovative, original, clearly described, suitable, and feasible;
- c. Expected results or outcomes are clearly stated, measurable, and achievable within the allotted time frame requested by the applicant;
- d. Proposed research fills knowledge gaps that are critical to the development of new innovations to address the stated problem or issue;
- e. Proposed research is up to date on the current state of the art (i.e., literature reviews have been completed);
- f. Proposed research includes agriculturally related Manufacturing and/or Energy Efficiency and/or Alternative and Renewable Energy technologies;
- g. Proposed research includes documentation to support access to facilities, equipment or expertise.

### **2. Market Potential**

- a. Does the outcome of the proposed activity lead to a marketable product, service or process that warrants significant USDA SBIR/STTR support?

- b. Has the proposing firm provided adequate information to validate the market opportunity? Is there enough information to validate the market opportunity? Has the proposing firm included information that indicates they understand business economics and market drivers in the target industry?
- c. Given the stage of the proposed effort, is the team well-balanced between technical and business skills?
- d. Has the proposing firm successfully commercialized SBIR/STTR supported innovations where prior awards have been made?
- e. Does the application demonstrate that the company has initiated dialogue with relevant stakeholders (potential customers or end users, strategic partners or investors) for the proposed innovation and that a legitimate business opportunity may exist should the technology prove feasible through the inclusion of letters of support? Does the application clearly justify why letters of support are not being included due to business considerations as it relates to the technical and commercial aspects of the innovation?

### 3. **Importance of the Problem**

- a. There is sufficient justification for the importance of the problem
- b. The proposed project is in the public interest

### 4. **Investigator and Resource Qualifications**

- a. Roles of key personnel are clearly defined;
- b. Key personnel have sufficient scientific and business expertise to complete the proposed project, and where appropriate, partnerships with other disciplines and institutions are established;
- c. PD and Co-PD biographic information/resumes provide relevant employment history;
- d. Support personnel, facilities, and instrumentation are sufficient;
- e. A clear plan is articulated for project management, including time allocated for attainment of objectives and delivery of products, maintenance of partnerships and collaborations, and a strategy to enhance communication, data sharing, and reporting among members of the project team;
- f. Consultants, subcontractors, or CRADA cooperators that are involved in the project have provided letters verifying their willingness to participate in the project;
- g. Personnel on subcontract(s) and consulting agreement(s) have defined roles and responsibilities.

### 5. **Budget**

- a. The budget is appropriate for the proposed project; and
- b. There is sufficient budget detail to indicate clearly how the funds would be utilized

### 6. **Duplication**

- a. There is no duplication of any ongoing or previous research by the small business firm or by other researchers; and
- b. Application clearly indicates how the proposed technology would differ significantly



NIFA uses an electronic Peer Review System (PRS) that allows reviewers of the application the ability to provide comments, scores and recommendations to SBIR/STTR staff. NIFA provides guidance and instructions to the reviewers on how to access PRS and that the following review criteria serves as the basis for the review. Approximately equal consideration will be given to each criterion, except for items (1) and (2) which will receive twice the value of any of the other items.

Additional factors that will be considered in the review process are whether an SBIR application involves a CRADA with a USDA or other Federal laboratory. For SBIR, in the event that two or more applications are of approximately equal merit, the existence of a CRADA with a USDA or other Federal laboratory or a follow-on funding commitment for Phase III will be an important consideration to break the tie. For STTR, the small business and the nonprofit research institution are **required** to include a formal cooperative agreement detailing the allocation of intellectual property rights to carry out follow-on research, development, or commercialization activities.

Applications for SBIR/STTR should contain letters of support for the proposed innovation that demonstrate the company has initiated dialogue with relevant stakeholders (potential customers or end users, strategic partners or investors). Furthermore, the letters should indicate if the technology proves feasible, then a legitimate business opportunity may exist.

### **C. 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 NIFA, 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 NIFA will retain for three years one file copy of all applications received. Public release of information for any application submitted will be subject to existing statutory and regulatory requirements. The legislation reauthorizing the SBIR/STTR Programs 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 NIFA.

#### **D. 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.

#### **Rights in Data Developed Under SBIR/STTR Funding Agreement.**

The Act provides for “retention by an SBC of the rights to data generated by the concern in the performance of an SBIR/STTR award.”

1. Each agency must refrain from disclosing SBIR/STTR technical data to outside the Government (except reviewers) and especially to competitors of the SBC, or from using the information to produce future technical procurement specifications that could harm the SBC that discovered and developed the innovation.
2. SBIR/STTR agencies must protect from disclosure and non-governmental use all SBIR/STTR technical data developed from work performed under an SBIR/STTR funding agreement for a period of not less than four years from delivery of the last deliverable under that agreement (either Phase I, Phase II, or Federally-funded SBIR/STTR Phase III) unless, subject to paragraph (3) of this section, the agency obtains permission to disclose such SBIR/STTR technical data from the awardee or SBIR/STTR applicant. Agencies are released from obligation to protect SBIR/STTR data upon expiration of the protection period except that any such data that is also protected and referenced under a subsequent SBIR/STTR award must remain protected through the protection period of that subsequent SBIR/STTR award. For example, if a Phase III award is issued within or after the Phase II data rights protection period and the Phase III award refers to and protects data developed and protected under the Phase II award, then that data must continue to be protected through the Phase III protection period. Agencies have discretion to adopt a protection period longer than four years. The Government retains a royalty-free license for Government use of any technical data delivered under an

SBIR/STTR award, whether patented or not. This section does not apply to program evaluation.

3. SBIR/STTR technical data rights apply to all SBIR/STTR awards, including subcontracts to such awards, that fall within the statutory definition of Phase I, II, or III of the SBIR/STTR Programs, as described in §4 of this Policy Directive. The scope and extent of the SBIR/STTR technical data rights applicable to Federally funded Phase III awards is identical to the SBIR/STTR data rights applicable to Phases I and II SBIR/STTR awards. The data rights protection period lapses only:

- a. Upon expiration of the protection period applicable to the SBIR/STTR award; or
- b. By agreement between the awardee and the agency.

#### **E. Copyrights**

Grantees also should assert copyright in scientific and technical articles based on data produced under the grant where necessary to effect journal publication or inclusion in proceedings associated with professional activities. Journal or other copyright practices are acceptable unless the copyright policy prevents the grantee from making copies for its own use.

Proper acknowledgement of public funding in published scientific articles, manuscripts, presentations and press releases is critical for the success of the agency's programs. Please use the following language to acknowledge NIFA support in such publications and associated presentations, as appropriate:

“This research was supported [in part] by the intramural research program of the U.S. Department of Agriculture, National Institute of Food and Agriculture, [insert program type Small Business Innovative Research, Small Business Technology Transfer, etc., and accession number, if applicable].”

The recipient must also include a disclaimer in all publications and presentations stating the following:

“The Findings and Conclusions in This Preliminary [Publication/Presentation/Blog] Have Not Been Formally Disseminated by the U.S. Department of Agriculture and Should Not Be Construed to Represent Any Agency Determination or Policy.”

Presentations should include this disclaimer on the title slide in similar font and size to the name and title of the presenter.

If the grantee plans to issue a press release concerning the outcome of NIFA grant-supported research, they should notify NIFA in advance to allow for coordination. Publications resulting from work performed under a NIFA grant-supported project must be included as part of the annual or final progress report submitted to NIFA. When publications are available electronically, electronic access information should be provided.

#### **F. 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 C.F.R. Part 401](#). These regulations provide that small businesses

normally may retain the principal worldwide patent rights to any invention developed with USDA NIFA support. USDA NIFA 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 NIFA 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:

Alexis Nazario Negron, Acting Director of Planning, Accountability, and Reporting  
National Institute of Food and Agriculture  
Email: [alexis.nazarionegron@usda.gov](mailto:alexis.nazarionegron@usda.gov)

SBIR/STTR 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](http://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.

#### **G. 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/STTR 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 RR OtherProjectInfo form found in § IV. 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 which have established such reviewing mechanisms to have this service performed.

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

1. 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 1\(c\)](#). All nonexempt research projects involving human subjects must be approved by an Institutional Review Board prior to commencing actual substantive work.
2. 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, 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.

#### **H. Grantee Commitments**

Upon issuance of a research grant by USDA NIFA, 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.

**I. Additional Information**

1. This RFA 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/STTR funding agreement, the terms and conditions of the funding agreement are controlling.
2. Before the award of an SBIR/STTR funding agreement, USDA NIFA 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 Grants Financial Management, 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. It is anticipated that all Phase I awardees will be required to submit the above information. Please note that USDA 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.

Under Federal law it is USDA NIFA's responsibility to ensure Federal funds are disbursed in accordance with Federal regulations. USDA NIFA reserves the right to enact additional oversight controls on awardees deemed to be high risk based on organizational management, personnel, and financial information provided.

3. 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/STTR NPLs (see Part VII of the RFA) for knowledge of how the transaction may affect a potential grant or the grant, as applicable.
4. USDA NIFA is not responsible for any monies expended by the applicant prior to the award of any funding agreement.
5. This RFA is not an offer by USDA NIFA and does not obligate USDA NIFA to make any specific number of awards. Also, awards under these programs are contingent upon the availability of funds.
6. Unsolicited applications will not be accepted under the SBIR/STTR programs.
7. The applicant must provide the total number of employees for the organization and its subsidiaries and/or parent company, if applicable.

**J. Organizational Management Information**

Applicants must submit specific management information relating to an applicant prior to an award and update the information as needed. Applicants may only have to update their information if they had previously provided the information under this or another NIFA program. NIFA provides the requisite forms during the pre-award process. Although an applicant may be

eligible for award under these programs, there are factors that may exclude an applicant from receiving federal financial and nonfinancial assistance and benefits under these programs (e.g., debarment or suspension of an individual, or a determination that an applicant is not responsible).

**K. Application Disposition**

Applicants may withdraw at any time before NIFA makes a final funding decision. NIFA will retain all applications, including withdrawn applications and unfunded applications.

## **PART VI. AWARD ADMINISTRATION**

### **A. General**

Within the limit of funds authorized, the NIFA awarding official will make grants to responsible and eligible applicants whose applications are judged most meritorious under the procedures set forth in this RFA. The date specified by the NIFA awarding official as the effective date of the grant must be no later than September 30 of the federal fiscal year in which the project is approved for support and funds are appropriated for such purpose, unless otherwise permitted by law. The project need not be initiated on the grant effective date, but as soon thereafter as practical so that project goals may be attained within the funded project period. All funds granted by NIFA under this RFA may be used only for the purpose for which they are granted in accordance with the approved application and budget, regulations, terms and conditions of the award, applicable federal cost principles, USDA assistance regulations, and [NIFA General Awards Administration Provisions, 7 CFR Part 3430, subparts A through E](#).

*Award Notice.* The award document will provide pertinent instructions and information as described in [2 CFR § 200.211](#) (see [NIFA's Terms and Conditions](#)).

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

Several federal statutes and regulations apply to grant applications and the projects outlined in this RFA (some are listed here: [Federal Regulations](#)). Unless specifically noted by statute or award-specific requirements, [NIFA Policy Guide](#) applies to all NIFA awards.

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

The output and reporting requirements are included in the award terms and conditions (see [Terms and Conditions](#) for information about NIFA award terms). If there are any program or award-specific award terms, those, if any, will be identified in the award.

#### **SBIR/STTR Phase I Technical Reports**

For all Phase I awards, an interim technical progress report must be submitted at approximately the mid-point in the project. In addition, a comprehensive final technical report must be submitted within 120 days following expiration of the Phase I grant. These reports will be submitted electronically per the award terms and conditions to [sbir@usda.gov](mailto:sbir@usda.gov).

Please note: All technical reports are held confidential for a period covering four years after the termination of the project. As such, proprietary information may be included in the interim and final technical reports when necessary to provide the USDA NIFA SBIR/STTR staff adequate information to evaluate the outcome of the project.

#### **REEReport**

Grantees are to submit initial project information and annual and summary reports to NIFA's electronic, Web-based inventory system, REEReport, 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 (see REEReport Guide for Project Directors). Please note: Reports submitted via REEReport will be placed in the USDA Current Research Information System (CRIS) database. CRIS is an online public database meant to provide information to the general public on all awards made by USDA NIFA. As such, proprietary information should not be included in these reports. Additionally, a REEReport

submission does not meet the requirements for the interim and final technical report as these are additional reports required under the terms and conditions for the grant.

### **Federal Financial Management Requirements**

Grantees are expected to comply with applicable federal financial management requirements included in the award's terms and conditions, 7 CFR 3403, 48 CFR part 31 and 2 CFR part 200. Below is a list of major requirements. Failure to comply could trigger significant audit liability and require global reconstruction of the grantees accounting system.

**Separation of Funds.** To avoid commingling of funds, grantees must establish a unique account(s) in their accounting system to capture and accumulate funding and related costs of the grant, apart from other federal and non-federal grants, projects and cost centers.

**Timekeeping.** To support direct and indirect labor charges, grantees must maintain hourly timesheets that encompass all hours worked and not worked on a daily basis. The timesheet should identify the: (a) grant, project or cost center being worked on; (b) number of hours worked on each; (c) description of work performed; and (d) Paid Time Off (PTO) hours. The total hours recorded each day should coincide with an individual's employment status in accordance with established policy (i.e., full-time employees work 8 hours each day, etc.).

**Paid Time Off (PTO).** Grantees may not directly charge a grant for time not spent working on the grant. Therefore, PTO (i.e., vacation, holiday, sick and other paid leave) is not recoverable directly from grants, but rather must be allocated to all grants, projects and cost centers over an entire cost accounting period.

**Full-Time University and other Organization Appointments.** For SBIR the effort and compensation of individuals budgeted to work on grants, but who also hold full-time appointments at a university or another organization, may not exceed 100 percent. If applicable, it is necessary to:

(a) obtain a letter releasing the individual from their full-time appointment. The release should be reflected in the organizations official payroll distribution system; (b) limit effort on the grant to time periods not covered by the full-time appointment; (c) or remove and replace with alternative research personnel. In addition, the primary employment of the Project Director/Principal Investigator (PD/PI) must be with the small business concern at the time of award and during the conduct of the proposed research. Eligible primary employment means that more than one-half (51%) of the PD's/PI's time is spent in the employ of the small business during the award period of performance. Primary employment with the small business precludes the applicant as a full-time employee with another organization or academic institution. While the PD/PI must work more than one-half (51%) of his/her time for the small business during the entire grant period, there is no time requirement for the PD's/PI's work on the proposed research.

For STTR Phase I, as determined by budget expenditures, a minimum of 30% and a maximum of 60% of the research or analytical work must be **performed by a single nonprofit research institution (e.g., University, Federal Laboratory, etc.)**. To apply to both the SBIR and STTR programs, at least 30% but not more than 33% of the research must be conducted by a single nonprofit research institution (e.g., University, Federal Laboratory, etc.)



**Owners of Closely Held Corporations (Limited Liability Companies, Partnerships, SCorporations, etc.).** Owners of closely held corporations whose compensation is charged directly or indirectly to federal awards, must take their compensation in the form of W-2 supported salaries or guaranteed payments in order to: (a) trigger expense recognition in the accounting system; (b) ensure all compensation is reflected in grant-specific ledgers; and (c) to create a clear audit trail.

**Consistent Treatment of Costs.** Grantees must treat costs consistently across all federal and nonfederal grants, projects and cost centers. For example, grantees may not direct-charge federal grants for costs typically considered indirect in nature, unless done consistently. Examples of indirect costs include administrative salaries, rent, accounting fees, utilities, etc. In most cases, the cost to develop an accounting system adequate to justify direct charging of the aforementioned items outweighs the benefits. As a result, use of an indirect cost rate is the most effective mechanism to recover these costs and not violate federal financial requirements of consistency, allocability and allowability. Additional guidance on indirect cost calculations can be found at <https://nifa.usda.gov/indirect-costs>.

## **PART VII. OTHER INFORMATION**

### **A. Use of Funds and Changes in Budget**

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

***Changes in Budget or Project Plans.*** In accordance with [2 CFR 200.308](#), awardees must request prior approval from NIFA for the following program or budget-related reasons (the awardee is subject to the terms and conditions identified in the award):

1. Change in the scope or the objective of the project or program without prior written approval (even if there is no associated budget revision requiring).
2. Change in a key person specified in the application or the federal award.
3. Disengagement from the project for more than three months, or a 25 percent reduction in time devoted to the project.
4. Inclusion of costs that require prior approval in accordance with [2 CFR 200 Subpart E \(Cost Principles\)](#), or [45 CFR Part 75 Appendix IX, \(Principles for Determining Costs Applicable to Research and Development under Awards and Contracts with Hospitals\)](#), or [48 CFR](#), unless waived by the federal awarding agency,
5. [48 CFR Part 31, Contract Cost Principles and Procedures](#);
6. Transfer of funds budgeted for participant support costs to other categories of expense ([2 CFR 200.456 Participant support costs](#));
7. Sub-awarding, transferring or contracting out of any work under a federal award, including fixed amount sub-awards (see [2 CFR 200.333, Fixed Amount Sub-awards](#)), unless described in the application and funded in the approved federal awards. This provision does not apply to the acquisition of supplies, material, equipment, or general support services.
8. Changes in the approved cost-sharing or matching provided by the non-federal entity; and
9. The need for additional federal funds to complete the project.

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

When an application results in an award, it becomes a part of NIFA transaction records, which are available to the public. Information that the Secretary of Agriculture determines to be confidential, privileged, or proprietary in nature will be held in confidence to the extent permitted by law. Therefore, applicants should clearly mark any information within the application they wish to have considered as confidential, privileged, or proprietary. NIFA will retain a copy of an application that does not result in an award for three years. Such an application will be released only with the consent of the applicant or to the extent required by law. An applicant may withdraw at any time prior to the final action thereon.

### **C. Regulatory Information**

These programs are not subject to the provisions of Executive Order 12372, which requires intergovernmental consultation with state and local officials. Under the provisions of the Paperwork Reduction Act of 1995 ([44 U.S.C. Chapter 35](#)), the collection of information requirements contained in this notice have been approved under [OMB Document No. 0524-0039](#).

## APPENDIX I: AGENCY CONTACT

### Program Contacts

#### 8.1 Forests and Related Resources

Dr. Diomides (Diomy) Zamora

[Diomides.Zamora@usda.gov](mailto:Diomides.Zamora@usda.gov)

(202) 590-6049

#### 8.2 Plant Production and Protection- Biology

Dr. Kari Perez

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(816) 550-8047

Dr. Christopher Philips

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(216) 390-4211

#### 8.3 Animal Production and Protection

Dr. Robert Smith

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(202) 445-3468

Dr. Frank Siewerdt

[Frank.Siewerdt@usda.gov](mailto:Frank.Siewerdt@usda.gov)

(816) 329-9745

#### 8.4 Conservation of Natural Resources

Dr. Sandeep Kumar

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(816) 832-7235

#### 8.5 Food Science and Nutrition

Dr. Jodi Williams

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(202) 424-9722

#### 8.6 Rural and Community Development

Dr. Keith Harris

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(816) 916-0332

#### 8.7 Aquaculture

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(816) 527-5434

#### 8.8 Biofuels and Biobased Products

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#### 8.12 Small and Mid-Size Farms

Dr. Denis Ebodaghe

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(202) 445-5460

#### 8.13 Plant Production and Protection– Engineering

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(816) 520-8456

Dr. Steven Thomson

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#### SBIR/STTR Program Coordinator

Melinda Coffman

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(816) 854-0299

#### SBIR/STTR General Mailbox

[sbir@usda.gov](mailto:sbir@usda.gov)

For science-related questions, please contact the topic area National Program Leaders.  
For program content-related questions, please contact the SBIR/STTR General Mailbox.

For administrative questions related to;

1. Grants.gov, see Part IV of this RFA
2. Other RFA or application questions, please email [grantapplicationquestions@usda.gov](mailto:grantapplicationquestions@usda.gov)
3. Awards under this RFA, please email [awards@usda.gov](mailto:awards@usda.gov)

**U.S. Postal Mailing Address:**

National Institute of Food and Agriculture  
U.S. Department of Agriculture  
P.O. Box 419205, MS 10000  
Kansas City, MO 64141-6205

**Courier/Package Delivery Address:**

National Institute of Food and Agriculture  
United States Department of Agriculture  
2312 East Bannister Road, MS 10000  
Kansas City, MO 64141-3061

## **APPENDIX II: GLOSSARY OF TERMS**

Authorized Organizational Representative – AR  
Catalog of Federal Domestic Assistance – CFDA  
Cooperative Research and Development Agreement – CRADA  
Data Management Plan – DMP  
Federally Funded R&D Center – FFRDC  
Historically Underutilized Business Zone – HUBZone  
Indirect Costs – IDC  
National Institute of Food and Agriculture – NIFA  
National Program Leader – NPL  
Project Director – PD  
Project Narrative – PN  
Project Summary – PS  
Research and Development – R&D  
Request for Application – RFA  
Research and Development – R&D  
Research, Education, and Economics – REE  
Small Business Administration – SBA  
Small Business Concern – SBC  
Small Business Research Innovation Program – SBIR  
Small Business Technology Transfer Program – STTR  
Technical and Business Assistance – TABA  
United States Department of Agriculture – USDA

## APPENDIX III: DEFINITIONS

Refer to [7 CFR 3430 Competitive and Noncompetitive Non-formula Federal Assistance Programs](#) – General Award Administrative Provisions for additional definitions.

### Affiliate

As set forth in [13 CFR Part 121—Small Business Size Regulations, §121.103](#). Further information about SBA's affiliation rules and a guide on affiliation is available at [SBIR STTR](#) and [Size Standards](#).

### Authorized Departmental Officer

The Secretary or any employee of the Department who has the authority to issue or modify grant instruments on behalf of the Secretary.

### Authorized Organizational Representative

The president, director, chief executive officer or other designated official of the applicant organization who has the authority to commit the resources of the organization, also referred to as the AR.

### Commercialization

The process of developing marketable products, processes, technologies, or services and the production and delivery (whether by the originating party or others) of the products, processes, technologies, or services for sale to or use by the Federal government or commercial markets.

### Continuation Award

An award instrument by which NIFA agrees to support a specified level of effort for a predetermined period of time with a statement of intention to provide additional support at a future date, provided that performance has been satisfactory, appropriations are available for this purpose, and continued support would be in the best interest of the federal government and the public.

### Covered Small Business Concern

A small business that is not majority-owned by multiple VCOCs, hedge funds, or private equity firms on the date on which it submits an application in response to a solicitation under the SBIR/STTR programs or on the date of the SBIR/STTR award.

### Cooperative Research and Development Agreement

A legal agreement between a Federal agency and one or more non-Federal parties. Purpose is to foster Federal/private collaborations to bring new technology to the marketplace. Used Federal government wide. Allows non-Federal party the right to negotiate an exclusive license to CRADA inventions.

### Direct Costs

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

### Fee

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

### Funding Agreement

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.

### Grant

A financial assistance mechanism providing money, property or both to an eligible entity to carry out the approved project or activity, and substantial programmatic involvement by

Government is not anticipated.

#### 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.”

#### Historically Underutilized Business Zone

A small business concern meeting the following criteria:

1. Located in a “historically underutilized business zone” or HUBZone area located in one or more of the following:
  - a. A qualified census tract (as defined in section 42(d)(5)(C)(i)(I) of the Internal Revenue Code of 1986);
  - b. A qualified “non-metropolitan county” (as defined in section 143(k)(2)(B) of the Internal Revenue Code of 1986); or
  - c. On an Indian Reservation- Land within the boundaries of a Federally recognized Indian Reservation.
2. Owned and controlled by one or more U.S. Citizens; and
3. At least 35 percent of its employees must reside in a HUBZone.

#### Indirect Costs

Costs which occur in support of more than one objective and therefore cannot be identified readily and specifically with a particular project, often called overhead, F&A, or G&A.

#### 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.

#### 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/STTR 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/STTR program.

#### Manufacturing Related

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

1. Unit process level technologies that create or improve manufacturing processes, including:
  - a. Fundamental improvements in existing manufacturing processes that deliver substantial productivity, quality, or environmental benefits; or
  - b. Development of new manufacturing processes, including new materials, coatings, methods, and associated practices.
2. Machine level technologies that create or improve manufacturing equipment, including:
  - a. 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
  - b. New apparatus and equipment for manufacturing, including additive and subtractive manufacturing, deformation and molding, assembly and test, semiconductor fabrication, and nanotechnology.

3. Systems level technologies for innovation in the manufacturing enterprise, including:
  - a. Advances in controls, sensors, networks, and other information technologies that improve the quality and productivity of manufacturing cells, lines, systems, and facilities;
  - b. Innovation in extended enterprise functions critical to manufacturing, such as quality systems, resource management, supply change integration and distribution, scheduling, and tracking; or
  - c. Technologies that enable integrated and collaborative product and process development, including computer- aided and expert systems for design, tolerance development, process and materials selection, life cycle cost estimation, rapid prototyping, and tooling.
4. Environment or societal level technologies that improve workforce abilities, productivity, and manufacturing competitiveness, including:
  - a. Technologies for improved workforce health and safety, such as human factors and ergonomics; or
  - b. Technologies that aid and improve workforce manufacturing skill and technical excellence, such as educational systems incorporating improved manufacturing knowledge and instructional methods.

#### Matching

The process through which a grant recipient match awarded USDA funds with cash and in-kind contributions on a dollar-for-dollar basis. The matching funds must derive from non-Federal sources.

#### New Application

An application not previously submitted to a program.

#### Peer Review Group

Experts or consultants, qualified by training and experience in particular scientific or technical fields to give expert advice on the scientific and technical merit of grant applications to those fields, who assemble as a group to discuss and evaluate all of the eligible applications submitted to this program in their area of expertise.

#### Program Solicitation

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

#### Project Director / Principal Investigator

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

#### Prototype

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

#### Renewal Application

A project application that seeks additional funding for a project beyond the period that was approved in an original or amended award.



Research or Research and Development (R/R&D) activity 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.

Resubmitted Application

A project application that was previously submitted to a program, but the application was not funded.

SBIR/STTR Participants

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

SBIR/STTR Technical Data:

All data generated during the performance of an SBIR/STTR award.

SBIR/STTR Technical Data Rights

The rights a small business concern obtains in data generated during the performance of any SBIR/STTR 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.

Small Business Concern

A concern that meets the requirements set forth in [13 CFR 121.702](#)

Small Business Entity

A small business entity is typically defined as a sole proprietorship, partnership, corporation, and S corporation. An LLC is a business structure allowed by state statute.

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.

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.

Women-owned Small Business Concern:

A women-owned small business concern is an SBC:

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.