

GRANTS PROGRAM: THE CENTER FOR PRODUCE SAFETY 2016 Request for Proposal Guidance

Public Partners:

California Department of Food and Agriculture – Specialty Crop Block Grant Program (CDFA-SCBGP)

RFP Deadlines: Concept proposals must be emailed to Bonnie Fernandez-Fenaroli at research@centerforproducesafety.org no later than 12:00 noon (Pacific Standard Time) on Monday, December 7, 2015; paper copies will not be accepted.

Full proposals will be by invitation only. Invitations and instructions to submit a full proposal will be sent to scientists between January 18 and January 31, 2016. Full proposals must be submitted by 12:00 noon (PST) on Friday, March 11, 2016.

Project Period: One-year and two-year proposals will be accepted. Projects will begin January 2017.

Total Funds Available: Up to \$3,000,000.

OBJECTIVE

Research activities sponsored by The Center for Produce Safety (CPS) and partner entities are to be directed to answering critical research questions that fill the gaps in our basic understanding in specific areas of food safety practices for fruit, vegetable, and tree nut production, harvest and post-harvest handling. The objective is to provide the produce industry with practical, translatable research data that can be used at levels throughout the supply chain.

GENERAL RESEARCH GUIDANCE

Consumption of fresh fruits and vegetables is a key element in the health and nutrition of people worldwide. The variety of products and year-round availability has opened up many exciting new ways for consumers to enjoy fruits, nuts and vegetables as never before. Multiple studies have shown that consumption is steadily increasing as consumers have adopted healthier lifestyles and taken advantage of new fruit, nut and vegetable products that offer year-round convenience, unique flavor combinations and nutritional balance. But along with this trend, the produce industry has faced numerous incidents over the last few years in which outbreaks of foodborne illness have been traced to the consumption of fruits, nuts and vegetables. The produce industry has attempted to meet these food safety challenges with the development of commodity-specific food safety programs centered on Good Agricultural Practices (GAPs) at the raw or commodity finished product level and fully integrated processing food safety approaches anchored by HACCP-based programs for packaged products. As food safety guidance documents and standards for an array of commodities have evolved to become more measurable, industry scientists have struggled with a deficit of specific scientific knowledge on which to base metrics. This has been further exacerbated by the ever increasing demand from multiple buying groups to have producers meet various microbial specifications for water, soil, raw and finished products, as well as food safety metrics that exceed industry standards without any real science-based direction.

RESEARCH PRIORITIES

Please refer to the CPS 2016 Research Priorities on the CPS website, www.centerforproducesafety.org or below (pages 5–13).

PROJECT FUNDING

After the review of all proposals, awards will be assigned by CPS to one or more funding sources.

GRANT LIMITS

Research awards may not exceed \$200,000 in total costs per year. The research project term may not exceed two years. (Proof of concept awards may not exceed \$50,000 in total costs, and the term may not exceed one year.)

RESEARCH PROJECT TERM

January 1, 2017 through December 31, 2017 for one-year research projects.

January 1, 2017 through December 31, 2018 for two-year research projects.

January 1, 2017 through December 31, 2017 for proof of concept projects. Note: Projects may be less than 12 months.

ELIGIBILITY

Projects should benefit the specialty crop industry and/or the public rather than a single organization, institution, individual, or commercial product. Funds will not be awarded for projects that directly benefit or provide a profit to a single organization, institution, or individual.

The following pertains to Specialty Crop Block Grant Program (SCBGP) funds that may be distributed through this program:

- To be eligible for a grant, the project must solely enhance the competitiveness of U.S. or U.S. territory grown specialty crops in either domestic or foreign markets. Specialty crops are fruits, vegetables, tree nuts, dried fruits, horticulture, and nursery crops (including floriculture). Visit the USDA Agricultural Marketing Service website at <http://www.ams.usda.gov/AMSV1.0/scbgp> for a list of eligible specialty crops and ineligible commodities.
- A recipient of funding from the 2016 Specialty Crop Block Grant Program must comply with the Federal Funding Accountability and Transparency Act (FFATA) of 2006 which will require obtaining a DUNS Number and maintaining a current registration with the System for Award Management at www.sam.gov.

PROOF OF CONCEPT PROJECT

A concept proposal may be submitted for a Proof of Concept project. CPS encourages proposals in which the primary outcome of the objective is one of the outcomes listed below:

1. To generate preliminary data to demonstrate proof of concept for novel or high-risk–high-reward produce safety solutions
 - Success criteria are heavily weighted to CPS anticipation of providing future funding, if outcomes are successful, and to attract leverage funding for the PI
2. To generate foundational data and practical proof of efficacy for highly focused preventive control or corrective action protocols
 - Success criteria are dependent on a convincing expectation that outcomes are rapidly transferrable to practice or policy and not necessarily dependent on further CPS funding
3. To generate preliminary data for a novel fundamental research concept that fits a long-term CPS priority
 - Success criteria are heavily weighted to CPS expectation that data outcomes will significantly increase the competitiveness for leveraged basic research funding to the PI

These proposals should address a question in the Research Priorities. Proof of Concept (POC) awards are typically short-term studies with budgets of \$15,000 to \$30,000, and may not exceed \$50,000 in total

costs or one year in length. For Category-2 POC proposals that immediately or preferentially benefit a single commodity, industry sector, technology provider, or service provider, it is typically expected that the beneficiary will commit at least 25% matching dollar funds and 25% valuation of in-kind support in the form of analytical equipment, consumable supplies, or facility operational expenditures (farm, equipment, pilot or commercial system). Provisions for protection of sponsor CBI (Confidential Business Information) are possible and expected, but results of POC research are subject to the same requirements for transparency and public disclosure accessibility as standard CPS awards.

CONCEPT PROPOSAL REVIEW

Concept proposals will be reviewed by drawn from the CPS Technical Committee and ad hoc reviewers. Those scientists invited to submit a full proposal will be advised to do so by the end of January 2016. Concept proposal instructions are available at the CPS website, at www.centerforproducesafety.org, or below (page 4).

2016 Concept Proposal

INSTRUCTIONS: Use this outline to prepare your Concept Proposal. You must use each of the 12 headings to provide the information requested. You are allowed a maximum of three, single-spaced pages to describe your proposed project. Use a sans serif font (Arial or Calibri preferred) no smaller than 11 point. No figures, graphical images, or tables can be used. Concept Proposals must be submitted via email to the Center for Produce Safety research email address, research@centerforproducesafety.org on or before **12:00 noon (Pacific) Monday, December 7, 2015** (no exceptions). All proposals must be submitted to by email; paper copies will not be accepted. A signed copy of the CPS Guidelines Acknowledgement Form, Appendix A, must accompany the Concept Proposal (see page 14).

Research awards may not exceed \$200,000 in total costs per year. Research project term may not exceed two years. Proof of Concept awards are typically short-term studies with budgets of \$15,000 to \$30,000 and may not exceed \$50,000 in total costs or one year in length.

1. CPS RESEARCH PRIORITY (refer to 2016 CPS Research Priorities and state priority number(s) and section title)
2. PROPOSED PROJECT TITLE (note: Must be concise and in the form of the anticipated outcome. If proposal is a re-submission it must be noted at the end of the title. For example: Lactic acid bacteria prevent growth of Listeria during cucumber distribution RE-SUBMISSION)
3. PRINCIPAL INVESTIGATOR (S)
4. CO-PRINCIPAL INVESTIGATOR (S)
5. RATIONALE AND OBJECTIVES
 - a. Justification of specific approach or technology validation
6. PRIOR EXPERIENCE RELEVANT TO PROJECT OBJECTIVES
7. PROPOSED METHODS
8. MEASURES OF SUCCESS
9. CRITICAL LITERATURE AND EXISTING TECHNOLOGY REVIEW THAT ESTABLISHES THE PROJECT RATIONALE (note: This is more than a list of published research; please explain how your proposal is different, or adds to the body of knowledge of published research.)
10. ESTIMATED TIMELINE
11. PROPOSED BUDGET – Year 1_____, Year 2_____ (Is this a Proof of Concept Proposal_____)
12. BACKGROUND REFERENCES

GRANTS PROGRAM: CENTER FOR PRODUCE SAFETY 2016 RFP Research Priorities Summary

The Center for Produce Safety sets its highest priorities in supporting research towards ready-to-use, data-based solutions or information which catalyze and support science-based actions and decisions to prevent or minimize produce safety vulnerabilities across the supply and marketing chain. To a significant degree, the sustainability of CPS to provide this resource and function demands that the greatest share of research award funds be allocated to investments in applied, practical, and knowledge gap-filling projects. These anticipated near-term research questions must be supported by longer-term fundamental research and limited objective proof-of-concept projects to explore novel solutions or to complete limited duration translation research of products or services of broad interest and adoption by the industry. While some priorities remain broad, other priorities are re-drafted for 2016 to capture and emphasize the input that CPS has received to more tightly focus the research question with specific anticipated data outcomes. With this mission in mind, the following priorities are provided as guidance to applicants to the 2016 CPS request for proposals. Research priorities are grouped in two parts: Part I – Core Produce Safety Research Objectives, and Part II – Commodity Specific areas provided by the Washington Tree Fruit Industry, California Fresh Fruit Association and the California Fresh Citrus Industry.

Part I. Core Produce Safety Research Objectives

The following produce safety research objectives have been identified through solicitation of input from the produce industry as well as government and academic stakeholders. In addition, feedback from CPS research meeting participants and reviews of previously funded CPS grants and research outcomes were utilized to identify research objectives. The research objectives have been reviewed and revised by the CPS Technical Committee for the 2016 request for proposals (RFP). Core produce safety research objectives have been streamlined and prioritized for 2016 but research concepts and objectives not specifically listed will be considered. The desire for science-based advancements to bridge or close our knowledge gaps and practical technological solutions in risk reduction cut across all fresh fruit, vegetable and nut crops. Research that will enhance produce safety systems span all phases of production, harvest, cooling, packing, fresh-processing, storage, transportation, receiving and point-of-sale environments. These research objectives are typically broad in scope and are written with the intent to encourage creative approaches to research that will improve our understanding of potential produce safety hazards, risks and routes of contamination, and aid in development of more effective, science-based risk identification and characterization. In some cases, priority is given to very specific research topics and a structured set of anticipated outcomes that align with industry input for a public source of data to support preventive control validation or the efficacy of corrective actions to food safety risks. It is hoped that both approaches to solicit research proposals lead to increased knowledge and practical technologies that support evolving strategies and food safety management tools throughout the entire supply chain.

For 2016, the following core produce safety research priorities are provided as the focal point for program needs but are not intended to preclude submission of topics within the broadest context of

produce safety. Importantly, details with background information about each of these identified research topics may be found on the CPS website at <http://www.centerforproducesafety.org/>. Principal investigators submitting a Concept Proposal are highly encouraged to review this information before submitting proposals. Principal investigators submitting a Research Proposal may also submit clarifying questions by telephone to (530) 554-9761 or by emailing the CPS Executive Director, Ms. Bonnie Fernandez-Fenaroli at bonnie@centerforproducesafety.org.

1. Prerequisite Produce Safety Research: Produce safety research requires expanded development of produce safety–specific research tools, techniques, materials and methods to address complex produce safety issues in the farm, adjacent farmscape and watershed environments, harvest operations, cooling facilities, packinghouses, re-pack operations, fresh-cut processing, transportation, distribution, retail or foodservice environments. While open to broad application of applied and more fundamental research proposals, specifically requested are research and development of tools and technologies regarding:

1.1. Remote Sensing of Risk Factors: Proof of Concept proposals are requested to develop baseline efficacy information and demonstration of data capture, analysis, and practical predictive modeling for the detection of presumptive risk of contamination and corrective action alert systems.

1.2. Validation of Surrogates for Preventive Controls: Additional research, extending fundamental research on this topic already funded by CPS, is needed to specifically validate previously qualified non-pathogenic surrogates for use as geospatially relevant standards and research tools and for in-situ commercial operation validation studies. These qualified surrogates may be for general environmental risk, process-specific, intervention-specific, and/or commodity-specific applications.

1.3. Closing Knowledge Gaps in FSMA Produce Rule-related Metrics: Die-off of pathogens, primarily but not limited to bacterial pathogens, has proven challenging to confidently predict, particularly in preharvest environments and conditions. The proposed Produce Safety Rule provides a management option in which produce growers may apply an assumed die-off rate, based on limited studies, for pathogens between an irrigation or foliar-application event (using source water that does not meet the proposed statistically determined standards) and harvest, or between harvest and reasonably anticipated shortest storage and distribution interval prior to food preparation or point of purchase. A broad diversity of science-based assessments under tightly-controlled conditions are needed to develop data and broaden knowledge critical to modeling die-off under conditions representative and reflecting the diversity of industry practices and environmental norms. CPS is requesting proposals designed to provide standardized, multi-regional projects that will provide foundational evidence for predictive modeling of pathogen die-off, which either strengthen and support current anticipated regulatory metrics for agricultural water or demonstrate the need for modifying this approach in view of clear limitations of these allowances in protection of public health.

1.4. Developing Science-based Evidence for Principles of Co-management: In many regions and, frequently, in operations under certified organic crop management, produce is grown on farmscapes in smaller production blocks and surrounded by woodlands or other wildlife habitat. As the anticipated Produce Rule or ancillary retail industry and direct–market buyer expectations engage a broader community of growers, this is likely to become an increasingly important business sustainability and management consideration. Although on-going research is addressing risk

potential and mitigation characteristic of these numerous small-scale farms, CPS is committed to solicit complimentary research that identifies practical, economical and effective measures to divert or direct animal foraging and movement away from production areas, with minimal disruption of animal access or use of their habitat and also compliant with federal and local regulations and ordinances. For example: What is the quantitative effectiveness and cost:benefit of diversion and/or food source cropping to prevent deer intrusion into fresh produce fields and crop contamination with zoonotic pathogens?

1.5. Evidence-based Standards for Produce Wash and Cooling Systems: Despite recent efforts to consolidate current science into a guiding matrix and framework for validation, verification, and critical monitoring standards for microbiological quality of aqueous produce cooling, transport, wash, or postharvest treatment, there remains an immediate need to address practical data-supported issues of process control within a high fidelity to commercial practices and current economic, training, or resource constraints. CPS, its international stakeholders, and commodity partners request diverse, limited or extended timeline proposals that collectively will further resolve the identification of critical factors which, individually or broadly, establish Water-based Process Controls Standard Validation by: 1. Metric verification and development; 2. Method verification and development; 3. Address multiple commodity types; 4. Incorporate multiple cooling, wash, or treatment systems and water quality variables.

2. Indicators and Index Microorganisms: Identify a singular or suite of culturable or non-culturable microorganisms, or biological or chemical markers that could quickly, easily and reliably indicate the presence or absence of human pathogenic viruses in agricultural inputs, within the on-farm agricultural environment, in/on produce commodities and in produce handling facilities.

3. Factors Affecting Human Pathogen Persistence: Related to Core Priority 1.3 – Research is needed to identify guidance principles to better predict the persistence and growth potential of human bacterial pathogens within the practical and realistic range of produce production, postharvest handling, and distribution environments to the point of purchase or food preparation. These principles should be generally transferable and translatable to diverse systems and scales of production and handling operations. Research results should include recommendations and/or guidance for system-wide preventive controls to reduce, control, or eliminate human pathogens in these environments and marketing channels. For 2016, CPS is specifically requesting research clearly elucidating:

3.1. Human Pathogen Persistence in the Produce Production Environment: Special attention is called to determining the prevalence, persistence and transference of *Cyclospora* to produce during production and in marketing channels. Concept Proposals which include clear evidence for the capacity to study survival and transference from endemic sources of *Cyclospora*-contaminated soil, water, or other environmental sources, whether on-site or in model systems, will be given priority.

3.2. Human Pathogen Viability, Growth and Detection in Postharvest Handling and Distribution: Special attention is called to determining the factors in bacterial pathogen stress responses during pre-harvest and postharvest handling and distribution conditions that favor reversion from a “viable but nonculturable” (VBNC) state to a detectable state in post-shipping surveillance, with a potentially corresponding elevated risk of illness when consumed.

4. Understanding Produce Risks: Industry practitioners and government regulators are limited in their ability to formulate truly science-based and risk-based produce safety best practices and policies. This limitation stems from their inability to integrate all the available information into a useable tool to assist in risk-ranking various hazards and routes of contamination and to most effectively deploy limited food safety resources. Specifically, development of qualitative and/or quantitative microbial risk assessment tools to aid in identifying and ranking produce safety risk factors comparing broad category operational assessments of risk to unique or regional operations. Research is needed to establish data fundamental for the development of a QMRA analysis that would lead to prioritization of preventive controls and interventions that optimally reduce public health and business risk.

5. Proof of Concept Mitigation Technologies and Preventive Controls: Proof of Concept proposals are requested to demonstrate the critical information needed to suggest longer-term investment in pre- and postharvest interventions that significantly reduce pathogens to non-detectable levels.

6. New High Priority Objectives:

6.1. CPS is requesting proposals for a comprehensive but limited timeline-scoping study to develop a White Paper consolidating the breadth of published research in the past 1.5 years of this RFP and all awarded research in the public domain, which should be systematically utilized in defining new priorities or directions in general RFP funding or specific research award placement for critical data needs. The proposal should be limited to a six-month period unless compelling justification is provided for a phased reporting approach, up to a one-year maximum.

6.2. Does application of approved and economically viable sanitizers achieve adequate and compliant disinfection of diverse fabrication and construction materials utilized in current packing, cooling and handling equipment and facilities?

6.3. Development of Best Practice Guidance for Measuring Key Water Sanitizers: Broad assessment of the variability in measurement of delivered and steady-state sanitizer dose across the fresh produce supply-chain and within the various scales of operation and diverse applications have taught us that meeting desired set-points and outcomes is harder to achieve for many commercial operations than bench-top testing would predict. Equally, reported sanitizer doses from preharvest to postharvest do not uniformly correlate with the expected outcomes in microbiological assessments of different bacterial groups in the treated water. While many systems are being used in good faith and according to standard, available protocols, it is clear that a greater understanding of in-practice dose measurement in relation to water quality constituents and commodity-specific parameters is needed to differentiate among practical Test Methods, which are sorely needed to define the required or allowable Accuracy and Precision. Whether compliance is determined by industry standards, customer specifications, or regulatory standards the protection of public health and the integrity of produce enterprises will increasingly require a greater level of performance in dose management and accurate documentation. CPS specifically requests a multi-state, multi-institution proposal to address the following Priority Objective:

Develop a matrix of Best Practice Guidance for measurement of sanitizer dose among various test kit options, which fit practical application expectations from small-scale to medium-scale applications

on-farm to packinghouse, and determine the fully associated costs. A broad diversity of actual in-use water quality constituents must be included. Test kit performance in accuracy and precision must be compared to technical analytical measurement of constituents, temperature, pre and post microbiological profile, and dose, including but not limited to hypochlorites, chlorine dioxide, ozone, and peracetic acids. Comparative assessments among reasonably paired operations across multiple states, locations, crops, scale of operation, and seasonal conditions are expected. The anticipated outcome is the development of a concise guidance document, which better informs produce industry operations, audit-scheme holders and developers, regulators, and buyers of the realistic expectations for managing sanitizers in water-based applications, by measurement and treatment-adjustment, that fit the characterized performance in microbiological control of cross-contamination for their scale of operation and economic resources.

6.4. Define system-wide and system-specific probabilities of *Listeria monocytogenes* for transference from non-food-contact surfaces and areas (Zone 2 to 4) to food-contact surfaces and products.

6.5. Develop a detailed design and comprehensive cost analysis of a large-scale daily water reconditioning and re-use system for water-use efficiency and conservation in primary packing operations, with data developed specifically in relation to food safety process controls and routine verification and monitoring of physicochemical and microbiological constituents. Close alignment and participation with a company collaborator is essential, but anticipated engineering design elements and management outcome principles should be broadly transferable regionally and to comparable scale commodities.

6.6. Much empirical and anecdotal information has been circulated among the produce industry regarding the efficacy of various EPA-labeled, non-labeled, and GRAS compound preharvest surface sanitizers to significantly reduce risk when applied several days preharvest, especially on leafy greens and pole-tomato fields. Definitive data is needed to guide the industry to informed decisions regarding the cost:benefit of this practice for any science-based assessment of these formulations, alone or in comparative studies.

6.7. Industry input has identified the need to validate an approved process for removal of fruit waxes and lusters applied to whole produce, which will significantly improve the efficacy of sequential pre-slice treatment in mechanical removal and sanitizer lethality of entrapped pathogens during minimal processing for fresh-cut products.

Part II. Commodity Specific

1. Pacific Northwest Tree Fruit

NOTE: Different from research awards solely supported by CPS, all projects under the Pacific Northwest Tree Fruit PIR must include a strong written, oral and web-based outreach component to better assess current practices and, as necessary, provide science-based knowledge to improve practices and decision-making industry wide.

Pacific Northwest Tree Fruit (PNTF) research objectives are as follows:

1.1. Agricultural Water: Agricultural water is used in various ways for tree fruit production in the Pacific Northwest. Among other uses, it may be applied for overhead sprinkler orchard irrigation and to apply fruit and foliage crop protection sprays on apple, pear, cherry and other stone fruit (apricot, nectarine, peach, and plum). To reduce damage from sunburn in apples, agricultural water may be applied by overhead sprinkler irrigation (also called overhead cooling). In these cases, agricultural water directly contacts fruit throughout the growing season. It is currently unclear if there is a public health risk associated with the use of agricultural water that is contaminated with human pathogens when used in a manner that directly contacts tree fruit in the orchard. The successful proposal will clearly identify and demonstrate how the proposed research objectives will advance, rather than duplicate or be limited to derivative model research, existing or in-progress studies identifiable in the public domain. Specifically, additional research is requested to:

- Determine how long human pathogens will persist (survive, die and/or grow) on tree fruit that have been directly sprayed in the orchard with agricultural water containing human pathogens. Special consideration should be given to the development of fruit inoculation protocols (materials and methods) that will yield meaningful, repeatable and applicable results for tree fruit grown in the Pacific Northwest.
- Determine the rationale and reasonably acceptable criteria for a “safe” preharvest time interval, relative to variable climatic/environmental factors during crop maturity, for agricultural water application based on current production practices, agro-ecological growing conditions and anticipated human pathogen persistence on tree fruit in the Pacific Northwest. What factors must be considered in establishing a standardized decision-tree or matrix for the required preharvest interval following foliar contact with a potentially contaminated water source?
- Identify how intrinsic and extrinsic factors (e.g., production practices and agro-ecological conditions) influence the persistence of human pathogens, and resistance to postharvest removal, on tree fruit that have been directly sprayed in the orchard with agricultural water containing human pathogens. Developing a model system to systematically evaluate the intrinsic and extrinsic factors that may affect the risks associated with the diverse production practices and agro-ecological growing conditions encountered in the Pacific Northwest is encouraged. The successful proposal will clearly identify and demonstrate how the proposed research objectives will advance, rather than duplicate or be limited to derivative model research, existing or in-progress studies identifiable in the public domain.
 - Based on recent events related to apple food safety concerns, we would like to specifically know:
 - (a) Do natural openings of the fruit (pedicel-end, calyx-end, lenticels) differentially harbor human pathogens or provide protected sites not penetrated by current practical technologies?
 - (b) What unexploited technologies will consistently reduce the pathogen load if problematic anatomical, physicochemical, or topographical locations are identified?
- Assess and characterize the microbial quality of agricultural water systems in the Pacific Northwest regions where the agricultural water is used in such a manner that it directly contacts

tree fruit in the orchard. Special consideration should be given to identification of intrinsic and extrinsic factors (e.g., time of year) that influence the microbial quality of agricultural water.

- Quantify the economic impact of reduced crop yield and fruit quality if production practices have to be altered considerably to comply with the FSMA regulations.

1.2. Development of Qualitative or Quantitative Microbial Risk Assessment: Develop models describing the likelihood of fruit contamination through common uses of agricultural water. Develop supporting data to assess the risk associated with the use of agricultural water that has been contaminated with human pathogens when directly applied to fruit in the orchard. The successful proposal will clearly identify and demonstrate how the proposed research objectives can be achieved by accessing existing or in-progress studies identifiable in the public domain, and be coordinated integration of studies in PNTF Objective 1.1.

1.3. Tree Fruit Packinghouse and Storage Operations: Tree fruit are routinely sorted, washed and packed for further distribution and sale in packing facilities. Cherry fruits are frequently run through a hydrocooler to remove field heat and thus aid postharvest fruit quality retention. Tree fruit packinghouse operations provide an opportunity for packers to reduce microbial loads of human pathogens on tree fruit but conversely provide an opportunity for tree fruit to be contaminated by cross-contact with contaminated water or food-contact surfaces. Specifically, research is needed to:

- Determine how effective current packinghouse preventive controls are in reducing the potential for food-contact surface-to-fruit and water-to-fruit cross contamination in packing lines and hydrocoolers. Specific emphasis should be given to identifying and ranking niches, harborages and food-contact surfaces that are likely to transfer human pathogens to fruit during packinghouse operations, according to risk, and determining if there are more effective equipment designs or material options available.
- Determine how effective current packinghouse preventive controls are in reducing the number of human pathogens on fruit as they proceed through packinghouse operations (e.g., antimicrobials in the dump tank, soap, wash, brushes, rinse, and heat). Special emphasis should be given to identifying packinghouse operations and operating variables that maximize the reduction of human pathogens on tree fruit. Investigation of water disinfectants that may effectively be used under current packinghouse operating conditions and practices is encouraged, particularly alternatives to chlorine.
- Develop a protocol (materials, methods, and criteria) to easily validate and verify that tree fruit packinghouse preventive controls are effective and performing as anticipated.
- Determine the fate of human pathogens, including *Listeria monocytogenes*, on fruit surfaces during common storage periods and when employing common storage practices, with special emphasis on technologies that may reduce the persistence of human pathogens in storage.
- **Special Emphasis Project – DPA and Fungicide Application Methods:** Apple fruit are routinely drenched with a solution containing one or both of: a) diphenylamine (DPA) to prevent scald development during long-term cold storage; or, b) a fungicide to control fruit decay in long-term cold storage. The most commonly used fungicides are Mertect (thiabendazole), Penbotec

(pyrimethanil), and Scholar (fludioxonil). It is currently unclear if there is a public health risk associated with re-circulation/re-use of the drench solution if human pathogens were to be introduced into the drench solution. Alternative application methods include fogging of antioxidants or fungicides into the storage room, or continuous treatment with ozone while fruit is being stored. The successful proposal will clearly identify and demonstrate how the proposed research objectives will advance, rather than duplicate or be limited to derivative model research, existing or in-progress studies identifiable in the public domain. Specifically, research is needed to:

- Determine if DPA/fungicide drench solutions have the potential to serve as a vector of drench solution-to-apple contamination for human pathogens. Special emphasis should be given to determining the likelihood of such contamination, and identifying factors that may limit or enhance the potential for such contamination events.
- Determine the potential for persistence, growth and/or proliferation of human pathogens in DPA/fungicide drench solutions and how this may affect the potential for fruit contamination.
- If necessary, develop effective, real-time and cost-effective means of monitoring, controlling, reducing, or eliminating human pathogens in drench solutions.
- Investigate the survival of human pathogens on fruit when treated with alternative, non-drench based methods of antioxidant and fungicide delivery to fruit such as fogging or ozone pulsing.

2. California Fresh Fruit Association

The California Fresh Fruit Association (CFFA) is seeking proposals to address the following questions related to postharvest handling and survival and growth of human pathogens on peaches, plums, and nectarines grown in the San Joaquin Valley of California, with special emphasis on developing greater risk reduction knowledge towards preventive controls for *Listeria monocytogenes*.

Successful proposals will clearly identify and demonstrate how the proposed research objectives will advance, rather than duplicate or be limited to derivative model research, existing or in-progress studies identifiable in the public domain. Furthermore, proposals that may result in anticipated benefits to industry in a one-year timeframe will be given priority consideration

2.1. How well do human pathogens survive and grow on the surface of fresh, whole stone fruit, and how are survival and growth affected by fruit finishes (mineral and vegetable oil-based waxes), postharvest fungicides, and the conditions found during commercial cooling, storage and transportation?

2.2. How does time, temperature, moisture, organic debris, fruit label adhesives, wax residues (mineral and vegetable oil-based waxes), and postharvest fungicides affect the survival and growth of human pathogens on common stone fruit packinghouse food-contact surfaces?

2.3. Are there commercially viable alternatives to the current industry practices of dewatering fruit with sponge rollers after washing and the use of brush beds to uniformly redistribute applied wax

and fungicide after dewatering? If yes, how do those alternatives compare to current industry practices with respect to the harborage and transfer of human pathogens?

3. California Fresh Citrus Industry (current focus on orange and lemon packinghouse operations)

Industry priorities are to develop data-based knowledge that address postharvest preventive controls and provide a science-based foundation for corrective actions aimed at identified food safety risks that are specific to the California fresh citrus industry. The immediate goal is to generate practical qualitative and quantitative operational standards for industry guidance in the form of Recommended Packinghouse Practices. Research is requested to:

- 3.1** Characterize the potential for survival, transfer, or movement of validated surrogates for human bacterial pathogens within a packinghouse, with emphasis on areas where product lots are comingled (e.g., float tanks, drench systems) and systems where water or waxes are recirculated/reused.
- 3.2** Identify and validate realistic, cost-effective intervention strategies that control, reduce, or eliminate human bacterial pathogens in recirculated/reused solutions and that can be applied within the broad range of California citrus packinghouses.
- 3.3** Determine the potential for growth of human bacterial pathogens on citrus fruit from harvest to pre-shipping storage under typical and sub-optimal conditions.
- 3.4** Using naturally-occurring nonpathogenic bacteria as indicators of efficacy, determine the effectiveness of current packinghouse preventive controls for reducing the number of potential human pathogens on citrus fruit as they proceed through commercial packinghouse operations, by a comprehensive assessment of process variability within and among different packinghouses and among different varieties of citrus fruit.
- 3.5** Develop a quantitative matrix of options and validation protocols for the most effective methods for cleaning and sanitizing harvest and postharvest fruit-contact surfaces and handling equipment.
- 3.6** Develop a detailed baseline spatial mapping profile, among confidentially enrolled handlers, towards the development of a model Environmental Monitoring Program (EMP) and guidance in establishing an environmental-zone Master Sanitation Schedule linked to EMP-outcomes for California fresh citrus packinghouses.

Appendix A

2016 CPS Request For Proposals Guidelines

Receipt Acknowledgement Form

Instructions: *This form acknowledges the Principal Investigator has received a copy of the 2016 CPS Request For Proposals Guidelines. Please submit with Concept Proposal in a separate file.*

Proposal Title
Print Name and Institution
Signature
Date

Full Proposal information (by invitation only) – forms will be available on the CPS website on January 11, 2016; www.centerforproducesafety.org

Full proposals will be reviewed by members drawn from the CPS Technical Committee and ad hoc reviewers, as appropriate. The reviewers will use the following as a guideline for their evaluation of the proposal. Sections are weighted as defined on the right.

Section *(all sections are required for a complete full proposal)*

Cover Sheet	*
Title Page	*
Layperson’s Summary of Proposal	*
Proposal (A-H, 10 page maximum)	
A. Technical Abstract	4
B. Background	2
C. Identification of Target Research Questions	1
D. Hypothesis	7
E. Research Objectives	10
F. Experimental Plan and Methods	30
G. Expected Results and Potential Impact on the Produce Industry	15
H. Potential Pitfalls to Accomplishing Objectives	2
Proposal - Additional Information (I-P, no page limit)	
I. Project Work Plan/Timeline	5
J. Facilities and Equipment Available for the Research	5
K. PI, Co-PIs, Academic and Industry Cooperators and Their Roles	4
L. Explanation of Related Research Funding	2
M. Previous SCBGP Funding and/or Submission to Federal or State Grant Programs	*
N. Project Oversight	*
O. Performance Monitoring Plan	*
P. Literature Cited/Bibliography	*
Additional Required Documents (no page limit)	
Budget Summary and Justification	7
Current and Pending Support for PI and Co-PIs	3
Biographical sketch for PI and Co-PIs	3
Letters of Support from Industry Cooperators	*
Abbreviation and Acronym Key	*
Confirmation of Institutional Permits and Authorizations to Conduct Restricted Laboratory Research and Studies involving Animal or Human Subjects	*
Resubmission Form (if applicable)	*

* All sections are required for a complete proposal package. Some sections have no numerical value assigned, but all sections are read and included in the reviewer’s evaluation of the proposal.

PROPOSAL FORMAT

For the title page, layperson's summary and Sections A-P use a sans serif font (Arial or Calibri preferred) no smaller than 11 point. Use 1 inch margins on all sides and single line spacing. Number pages for Sections A-P at the bottom. The body of the proposal (Sections A through H) may not exceed 10 pages. The title page, layperson's summary, and Sections I through P *are not* included in the 10-page limit. The additional required documents (budget summary and justification, current and pending support, biographical sketches, letters of support, abbreviation and acronym key, Institutional Permits and Authorizations, resubmission form) *are not* included in the 10-page limit. Required form templates (Cover Sheet, Budget Summary and Justification, Current and Pending Support, Biographical Sketch, Institutional Permits and Authorizations, Resubmission Form) for 2016 proposals must be downloaded from the CPS website, www.centerforproducesafety.org. The forms were created with MS Office 2010. If you have an earlier version of MS Office you may need to "save as" and select your version. Follow the format, style and guidelines described here and on the sample proposal in Appendix B.

Cover Sheet

- Use the form downloaded from the CPS website, www.centerforproducesafety.org.
- Complete all sections of the cover sheet.
- The cover sheet must be signed by the Principal Investigator, all Co-PIs, and by an official authorized to sign for their institutions. Signatures and institutional approval for the PI and Co-PIs may appear on separate cover sheets.
 - The *Principal Investigator* (PI) is that person whose name appears first on the title page of the proposal. The PI is mutually agreed upon by the cooperating scientists and is responsible for the submission of scientific reports, administration of the grant, notification of changes in the work plan or budget, and maintaining contact with CPS. The affiliated institution of the PI becomes the *principal institution* and signs the research agreement.
 - *Co-principal Investigators* (Co-PIs) are those persons whose names appear after the PI on the title page of the proposal. Co-PIs are individuals who are involved with the PI in the scientific development or execution of a project. The Co-PIs may be affiliated with the PI's organization or another organization participating in the project.
 - *Cooperators* are other investigators listed on the title page who are neither the PI nor Co-PI.
- Proposals from USDA Agricultural Research Service scientists should have prior approval through USDA's "ARIS, Incoming Agreements" process for CPS indirect cost restrictions and budget requirements.

Title Page

- Project title: Provide a clear, concise title that describes the project. Capitalize only the first word and proper nouns. Title may not exceed 130 characters and spaces.
- Principal Investigator: Name, institutional affiliation, mailing address, phone number, email address.
- Co-PIs: Name, institutional affiliation, mailing address, phone number, email address.
- Industry Cooperators: Name, title, company, mailing address, phone number, e-mail address.

Layperson's Summary of Proposal

- Summarize your proposal in non-technical language suitable for dissemination to the public.
- Provide a description of the project, objectives and methods to be employed.
- Do not exceed 200 words.

Proposal Proper (Sections A-H, 10 page maximum)

A. Technical Abstract

- The technical abstract should offer a concise summation of the proposal to the reviewers.
- It should conclude with a clear impact statement derived from the anticipated outcomes.
- Do not exceed 500 words.

B. Background

- Write a concise statement of the project purpose – the specific issue, problem, or research need to be addressed.
- Explain why this project is important and timely.

C. Identification of Target Research Questions

- Identify one or more of the 2015 Research Priorities the project addresses.
- Research Priorities may be found on the CPS website, <http://www.centerforproducesafety.org>

D. Hypothesis

- Clearly state the hypothesis-driven approach that conveys the rational and biological or technological foundation for the proposed research.

E. Research Objectives

- Logically arrange the objectives.

F. Experimental Plan and Methods

- For each research objective discuss the procedures you propose to employ.
- Be specific enough to discuss relevant biological strains, experimental design or parameters of data collection, sampling and sample analysis protocols, and anticipated statistical analysis.
- Emphasize quantifiable and measurable outcomes.

G. Expected Results, Beneficiaries and Potential Impact on the Produce Industry

- Name the beneficiaries of the project; how they will be impacted; and the approximate number of beneficiaries that will be impacted.
- For the proposed work describe the anticipated benefits to near-term food safety solutions for the produce industry.
- Describe your previous or current work directly related to the objectives and the results that have been generated to date.
- Address how this project will guide more specific and effective risk management practices for the industry.
- Include at least one distinct, quantifiable and measurable outcome that directly and meaningfully supports the project's purpose and is of direct importance to the intended beneficiaries. The expected measurable outcome should include:
 - Goal
 - Performance measure
 - Benchmark
 - Target

H. Potential Pitfalls to Accomplishing Objectives

- Describe the pitfalls that may be anticipated and your strategies for overcoming these pitfalls.

Proposal – Additional Required Information (Sections I through P, no page limit)

I. Project Work Plan/Timeline

- Using a table format prepare a Work Plan that clearly delineates the activities and timeframe anticipated to achieve each objective within the term of the project.
- Include a 3-column table with the following headings and information:
 - *Project Activity* – activities necessary to accomplish the project objectives.

- *Performed by* - personnel involved in each activity.
- *Timeline* - month and year in which you estimate the activities will start *and* end.
- Include required reports in the work plan.
 - Progress reports – due March 31 and September 30
 - Final report – due 30 days after end of research term
- Include presentation of research progress and/or final results at the CPS Produce Research Symposium.
 - For one-year projects, present final results at the June 2017 symposium.
 - For two-year projects, present interim research progress at the June 2017 symposium and final results at the June 2018 symposium.
- If subcontractors or collaborative arrangements are used in your project, include their activities in your work plan/timeline.
- Your data collection plan should be integrated into the project timeline.

J. Facilities and Equipment Available for Research

- Briefly describe the facilities and equipment available to you to achieve the proposed objectives.

K. PI, Co-PIs and Cooperators and Their Roles

- Specify the role of project personnel (PI, Co-PIs, support staff, industry cooperators) in achieving the project objectives.
- Include their titles and estimated percent of time they will devote to this project.

L. Explanation of Related Research Funding

- Identify your current or pending research funding that has relevance or overlap with the proposed research (see Section M also).
- If there is overlap, briefly discuss how the objectives for this proposal are unique or supplement current or pending research.

M. Previous SCBGP Funding and/or Submission to Federal or State Grant Programs

- If the project *builds on* a previously funded SCBGP project:
 - Describe how the project complements *and* differs from the previously funded project. Provide a summary (three to five sentences per project) of the results of the completed work, the long-term quantifiable effects of the results, especially as they impact the specialty crop industry, and how this project will supplement or build on previous funding from the SCBGP.
- If the project does not build on a previous SCBGP project, state that it does not.
- State whether the project has been submitted to or funded by another federal or state grant program and describe how the project supplements the efforts and does not duplicate funding efforts.
- If the project has not been submitted to or funded by another federal or state grant program, state that it has not.

N. Project Oversight

- Describe the oversight practices that provide sufficient knowledge of all grant activities to ensure proper and efficient administration.
- Address the following:
 - Identify the PI and Co-PIs who will oversee the project activities.
 - How the oversight will be performed.
 - Include time frame for oversight practices.

O. Performance Monitoring Plan

- This plan describes the process of collecting and analyzing data to meet the outcome-oriented objectives. Address the following:
 - Who will collect data.

- How and where data will be collected.
- If using a survey, provide information on the nature of the questions that will be asked, the methodology to be used, and the population to be surveyed.
- Outline how data gathered will be used to correct deficiencies and improve performance.
- If applicable, indicate how monitoring will occur after the grant period ends without continued funding.

P. Literature Cited/Bibliography

Additional Required Documents (no page limit)

- **Budget Summary and Budget Justification**
 - Use the 2016 form provided on the CPS website (www.centerforproducesafety.org).
 - Requirements and restrictions for Budget Summary and Budget Justification found on pg. 16-18.
- **Current and Pending Support for PI and Co-PIs**
 - Use the 2016 form provided on the CPS website (www.centerforproducesafety.org).
 - Include this proposal under pending support.
- **Biographical Sketch for PI and Co-PIs**
 - Use the 2016 form provided on the CPS website (www.centerforproducesafety.org).
 - Maximum of 2 pages for each investigator.
 - Include only publications most relevant to this proposal.
- **Letters of Support from Industry Cooperators**
 - Include a signed letter of support for each **industry** cooperator specifying their role in the project objectives and any facility infrastructure or in-kind support they will provide.
 - The review of your proposal includes an evaluation of your industry cooperators. Letters of support from them are strongly recommended.
- **Abbreviation and Acronym Key**
 - Include key for all abbreviations and acronyms used in proposal and budget justification.
- **Confirmation of Institutional Permits and Authorizations to Conduct Restricted Laboratory Research and Studies Involving Animal or Human Subjects**
 - Use form provided on CPS website (www.centerforproducesafety.org). Sign and date form.
- **Resubmission form**
 - Use the 2016 form provided on the CPS Grant website (www.centerforproducesafety.org).
 - If you have previously submitted a similar proposal to CPS, include the resubmission form with your proposal, indicating year it was previously submitted, title, and include a brief narrative describing what has been revised, added or deleted in your 2016 proposal. A new proposal is expected to be substantially different in content and scope. It should exhibit a significant change in direction and approach and include substantial changes in all sections of the research plan.

Optional Document

- **Suggested/Restricted Reviewers**
 - You may send a short list of suggested reviewers for consideration. Likewise, a short list of persons to whom the proposal should not be sent for review may be included.
 - List their names, titles, affiliations, addresses, email addresses, phone numbers and a brief justification for restricted reviewers.
 - Send this by email to research@centerforproducesafety.org no later than Tuesday, March 15, 2016.

BUDGET REQUIREMENTS AND RESTRICTIONS

Budget Summary and Justification

Download the 2016 form provided on the CPS website (www.centerforproducesafety.org) and provide all requested information. Complete the 1-page budget summary for your project and provide budget details and justification on separate justification forms for Year 1 and Year 2. If you will be issuing a subaward or subcontract to another university or organization, include the total amount for that subaward in your budget under Contractual. The Co-PI receiving the subaward must complete a scope of work statement and separate budget summary and justification form that will be submitted with your proposal. A sample completed budget summary and justification is in Appendix B.

The Budget Summary and Justification templates are MS Excel 2010 spreadsheets. On the justification forms rows may be added to or deleted from budget categories as needed. Cells were merged to create this form, so “auto resize” will not work. You may need to manually resize row height to view all text if cells contain a large amount of text (e.g., salary, travel, supplies, etc.).

- **Personnel**

- **Salary:** Funds may not be requested for salary for the PI or Co-PI, even if they are only partially funded by their universities or organizations. The budget may include salary for support personnel (e.g., lab staff, undergraduate and graduate students) proportional to the time devoted to the research project. For the PI and Co-PIs show their title, percent of full-time equivalent (FTE) for this project and zero salary. For each support staff member show their title, percent of full time equivalent (FTE) for this project, annual salary and the corresponding salary requested.
- **Fringe Benefits:** Funds may not be requested for fringe benefits for the PI or Co-PI, even if they are only partially funded by their universities or organizations. The budget may include fringe benefits for support personnel proportional to the time devoted to the research project. For each support staff member show their title, salary requested for the project, fringe benefit rate (as a percentage of salary), and the corresponding benefits requested. Fringe benefit rate may not exceed 50%.

- **Travel**

- Travel funds may be requested for field work, for meetings with Co-PIs or cooperators, for the PI to travel to present research progress at the CPS Produce Research Symposium, and for the PI and one Co-PI to travel to present final research results at the CPS Produce Research Symposium. If your project period is one year (January 2017-December 2017), request funds to present final research results at the June 2018 symposium on the East Coast in the Year 2 budget. If your project period is two years (January 2017-December 2018), request funds to present research progress at the June 2019 symposium on the East Coast in the Year 2 budget, and to present final research results at the June 2019 symposium on the West Coast, also in the Year 2 budget. Project periods are limited to one or two years, but awards will be written to allow use of travel funds for the CPS symposium in the June following completion of your research project.
- In a brief narrative statement, provide the following information for each trip requested:
 - Total amount requested for trip
 - Origin & destination
 - Purpose of trip
 - Number of trips required for this purpose (if more than one during the year)
 - Number or titles of people traveling
 - Number of days traveling/person

- Estimated airfare costs/person
- Estimated ground transportation costs/person
- Estimated lodging costs/person
- Estimated meal costs/person
- Estimated mileage costs for use of a private vehicle (# miles * 57.5 cents/mile: IRS rate published in Announcement IR 2014-114, effective after January 1, 2015).
- Travel funds *may not* be requested to attend or present research results at other professional meetings.
- **Equipment** (*single item purchase with a cost \geq \$5,000 and a useful life of more than one year*)
 - Funds for nonexpendable equipment will only be considered under special circumstances when the equipment is essential for completion of the proposed work. Detailed supporting information (including a justification and quotes) should be attached for any request for nonexpendable equipment.
 - If the cost is under \$5,000, include under Supplies and Materials.
- **Supplies and Materials**
 - Funds are allowed for materials and expendable supplies needed to conduct your research.
 - Provide an itemized list of the materials and supplies, their purpose in your research, the estimated quantity and cost.
- **Contractual**
 - If you will be issuing a subaward or subcontract to another university, include the total amount for the subaward in your budget under Contractual.
 - The Co-PI receiving the subaward must complete a statement describing their work on your project and a separate budget summary and justification to be submitted with your proposal.
 - Contractual work must indicate whether Flat Fee or Hourly rate is used. Hourly rates may not exceed GS-15 Step 10 of Federal Pay Scales unless justification is provided and approved. Flat fee estimates must indicate how you arrived at the rate. Specific information for your area is available at <https://www.opm.gov/policy-data-oversight/pay-leave/salaries-wages/salary-tables/pdf/2015/saltbl.pdf>
- **Other Costs**
 - Provide an itemized list describing other costs, their purpose in your research, the estimated quantity and cost.
 - Appropriate other costs include:
 - Rental of special purpose equipment required to complete your research.
 - The cost of outreach materials, shipping and handling if the project includes an outreach component.
 - Costs of preparing and publishing the results of your project, including reprints, page charges and illustrations.
 - Stipends to participants in field studies.
 - Costs of computer-based retrieval of scientific and technical information may be requested if such services are required for completion of the project objectives and it is the normal policy of the recipient institution to charge for the use of such facilities.
- **Indirect Costs**
 - For this RFP, prepare proposal budgets using a rate of 6% of personnel costs (salary + benefits).
 - See information below regarding restrictions on allowable costs.
- **Program Income**
 - Indicate if your project will generate program income. If yes, provide a brief description.

Budget Restrictions

Please note that some sponsors have restrictions on allowable costs. Please note costs and term limits may vary by partner. If an awarded project is selected for funding by one of the sponsors with specified restrictions, PIs will be required to modify their budget summary and budget justifications accordingly. During the proposal stage, a budget summary and justification should be prepared with the assumption that all costs will be allowable.

- **Indirect costs:** Prepare all proposal budgets using an indirect cost rate of 6% of total personnel (salaries/wages + fringe benefits). However, based on specific funding entities' requirements indirect costs may be restricted or not allowed. Once the funding source for an award is assigned by CPS, we will request the budget summary and justification be revised to reflect the sponsor's indirect cost rate restrictions:
 - For awards funded by CDFA-SCBGP the maximum indirect cost is six percent (6%) of total personnel costs (salaries and wages plus fringe benefits). Rate is subject to change, pending passage of a Farm Bill and USDA SCBGP regulations.
 - For awards funded by the CPS Campaign for Research indirect costs may not exceed six percent (6%) of total personnel costs (salaries and wages plus fringe benefits).
 - For awards funded by WSDA-SCBGP, ISDA-SCBGP and ODA-SCBGP indirect costs are not allowed.
 - For awards funded by commissions and boards under the agreement between the California Marketing Program and The Regents of the University of California indirect costs are not allowed.
 - Costs that are a part of the institution's indirect cost pool (e.g., administrative or clerical salaries) may not be reclassified as direct costs for the purpose of making them allowable.
- **Capital Expenditures:** Award funds cannot be used for the renovation or refurbishment of research spaces; the purchase or installation of fixed equipment in such spaces; or for the planning, repair, rehabilitation, acquisition, or construction of a building or facility

All budgets must be approved by CPS and the corresponding funding agency. The budget summary and justification must contain sufficient detail and be approved by the funding agency prior to execution of an award. Budget revisions requested must be submitted in a timely manner or funding may be delayed or rejected.

TO SUBMIT YOUR PROPOSAL:

1. Email complete proposal as a single PDF Document in order specified below to research@centerforproducesafety.org, no later than 5:00 PM (Pacific) on **Friday, March 11, 2016**.
2. Email a second file with the title page, layperson's summary, technical abstract and research objectives as a single MS Word document.
 - a) Name your title page/summary/abstract/research objectives document
3. Send 3 one-sided hard copies of the complete proposal in the order specified below (fasten copies with binder clips or paper clips - do not staple). Three hard copies of the proposal must be delivered to CPS no later than 3:00 p.m. (Pacific) on **Monday, March 14, 2016**:

Bonnie Fernandez-Fenaroli, Executive Director
Center for Produce Safety
1100 Main Street, Suite 210
Woodland, CA 95995
(530) 554-9761

Uploaded PDF proposal and hard copies must be exact duplicates.

Proposal documents must be in this order in your PDF upload file and hard copies:

- Cover sheet
- Title page
- Layperson's summary
- Sections A-H (10 page limit) and Sections I-P
- Budget Summary and Justification for PI
- Budget Summary and Justification for subaward or subcontract (if applicable)
- Statement of scope of work for subaward or subcontract (if applicable)
- Current and pending support form for PI and Co-PIs
- Biographical sketch forms for PI and Co-PIs
- Letters of support from industry cooperators
- Abbreviation and acronym key
- Confirmation of Institutional Permits and Authorizations to Conduct Restricted Laboratory Research and Studies Involving Animal or Human subjects.
- Resubmission form (if applicable)

Optional document

- You may submit a short list of suggested or restricted reviewers for consideration. Provide names, titles, affiliations, email addresses, phone numbers, and a brief justification for restricted reviewers. Send by email to research@centerforproducesafety.org by Tuesday, March 15, 2016. **Do not include this document in the proposal.** This should be a separate document.

Proposals will be evaluated by a review panel of at least three experts drawn from the CPS Technical Committee and/or ad hoc reviewers, as appropriate. CPS will provide feedback to all PIs whose projects were not selected for funding in October 2016.

AWARD NOTIFICATION

The CPS executive director will notify successful applicants after a peer review of all proposals and approval of projects by specific funding entities. The announcement of awards is expected in October–November 2016, pending commitment of USDA funds to the 2016 Specialty Crop Block Grant Program. PIs awarded grants may be asked to give additional information.

REPORTING REQUIREMENTS

- Progress reports (~2 pages) will be submitted to CPS by email. The format will be provided by CPS. These will be due on March 31 and September 30.
- Final reports (~5-15 pages) will be submitted to CPS by email. These will be due 30 days after end of the research project term. The format will be provided by CPS.
- Funding entities may have additional reporting requirements.
 - Specialty Crop Block Grant Funds grant recipients will be required to complete Progress Reports and a Final Performance Report limited to 5 pages. The report form will be provided by CPS.
- All research results reported in the progress and final reports will be public information and posted on the CPS website.
- Produce Research Symposium
 - All PIs funded by The Center for Produce Safety are required to participate in the annual CPS Produce Research Symposium and present results of their research.
 - For a one-year project you will prepare a poster to send to the CPS Produce Research Symposium in June 2016. You will present your final research findings at the CPS Produce Research Symposium in June 2017.
 - For a two-year project, you will prepare a poster to send to the CPS Produce Research Symposium in June 2016. You will present your research progress for Year 1 at the CPS Produce Research Symposium in June 2017 and present your final research findings for Years 1 and 2 at the CPS Produce Research Symposium in June 2018.
- Written progress and final reports of results will appear in the proceedings of the symposium and will be posted on the CPS website.
- The CPS Technical Committee and Advisory Board are studying the possibility of publishing research presented at the symposium as a collection of peer-reviewed articles in a scientific journal devoted to food safety.
- All publications must acknowledge CPS and the specific funding agency; grant funding will acknowledge both entities.

SUGGESTIONS FOR A SUCCESSFUL PROPOSAL

- A significant volume of literature exists in produce safety microbiology and related fields. The CPS Global Research Database (www.centerforproducesafety.org/global_research_database.php) is a resource that can be used by PIs to review the current literature. Reports for previously-funded CPS research are also available online (http://www.centerforproducesafety.org/grant_opportunities_awards.php) and these data may not yet be published. The PI should ensure that they have adequately reviewed the literature and that they describe how the proposed research will complement or expand on existing research.
- The produce industry is very dynamic and practices that were common five years ago may no longer be routinely practiced. In addition, practices for a given crop are often region specific. PIs are encouraged to reach out to the produce industry (independently or through CPS) as they are preparing their proposals to make sure the proposed research applies to regionally-appropriate and current practices.
- Review the Proposal Review guidelines to gain an understanding of how the reviewers will be asked to evaluate each proposal. This will give you a road map to areas of the proposal that are most important to the review and ranking process.
- The review process will focus on the scientific merit of the proposed research and the relevance of the proposal to the produce industry as described in the RFP research priorities and specific questions.
- It is not necessary for a proposal to address all aspects of a specific question in the RFP research priorities. These questions are guidelines as to what the industry has identified as priorities, but it is understood that they are broad in scope and may be beyond the reach of a single research proposal.
- The most common criticisms stated by reviewers are *vague*, *overly ambitious* or *unfocused*. Present clear objectives, well-founded hypotheses and work plans that address the stated objectives. Clearly address potential pitfalls or experimental dependencies and how the experimental plan will modulate the occurrence or impact on successful execution of the project plan.
- A key function of CPS is to fund research that can be used by growers, harvesters, shippers and processors to solve critical food safety problems, to provide new insights to optimization of processes, or to establish a novel directional basis for future research. Be sure your proposal aims to advance a near-term solution to a specific food safety problem.
- Careful formatting and proofreading are essential for professional evaluation of the proposal. In addition to the expectations for professional organizational style, spelling and grammar, give careful attention to budget and justification calculations, correct citations, and the quality of any imbedded images, figures, or graphs.

CPS CONTACT

Send questions to research@centerforproducesafety.org