



2021 Request for Pre-Proposals

The Mission of the Citrus Research and Development Foundation (CRDF) is to advance disease and production research and product development activities to insure the survival and competitiveness of Florida's citrus growers through innovation and scientific discovery.

The purpose of this CRDF request for proposals (RFP) is to solicit research projects that develop management strategies to improve citrus tree health, fruit yield and quality in HLB affected trees. Proposals should be hypothesis-driven, knowledge-building research projects, the results of which will lead to near-term solutions to HLB. Researchers are encouraged to submit projects that are narrow in scope and which seek to answer single questions.

Pre-proposals and subsequent invited full proposals will be reviewed by the Research Management Committee or the Commercial Product Delivery Committee, each a committee of CRDF, the Scientific Advisory Board and the Board of Directors. External, ad hoc expert reviewers will also review invited full proposals. Decisions on pre-proposals invited to submit full proposals and subsequent proposal approval will be made by the Board of Directors based on the recommendations received from either the Research Management Committee or the Commercial Product Delivery Committee.

Proposals shall address at least one of the following topics:

Investigation of HLB-affected trees to reduce yield loss*. Research approaches may include but are not limited to:

- 1) Understanding the mechanisms for increasing fruit retention in HLB trees by manipulating hormonal balance in the fruit and the tree or by altering the relationship between vegetative and reproductive activity with hedging and topping the canopy.
- 2) Confirm the relationship between root health (i.e., density, longevity) and fruit drop by reduction of plant stress caused by deficiency of water, nutrient, pest and/or pathogens.
- 3) Management strategies involving plant growth regulators and/or tree covers to reduce damage by foliar and root pests and pathogens in young citrus trees.
- 4) Tolerance of rootstocks to sting nematode and/or measures to reduce sting root damage to reduce losses in tree growth/production during establishment.
- 5) Develop a simple, cost effective device/method of tree injection directly into the phloem to deliver an effective dose of bactericides, biorational compounds (e.g. antimicrobial peptides) or nutrient formulations for sustainable reduction of CLas titer in bearing trees. Additional considerations may involve minimizing mechanical injury, phytotoxicity and residues in fruit or

juice. Consideration will also be given to devices designed to remain in the tree for at least a 10-year period.

- 6) Develop an assay for tree response to damage by CLas infection as a measure of success of therapies for HLB control.
- 7) Utilizing an assay such as plant hairy roots (Irigoyen et al. Nature Commun. 11, 5802) or another novel assay to screen for potent peptides to prevent multiplication of CLas or induce resistance to CLas. Also, an approach could involve synthesizing hybrids between different peptides with increased antimicrobial activity or increased likelihood of regulatory acceptance. Consider the use of membrane-permeable peptides such as those being considered for medical uses to make membranes permeable to other molecules or to be used to be ligated to other proteins/peptides to move them into the phloem.
- 8) Evaluate tree size controlling rootstocks in a high-density planting to enable mechanical harvesting. Determine the optimum tree density and fertilizer rate to establish fruit bearing including an economic analysis of the inputs.
- 9) Incidence of Greasy Spot (GS) rind blotch on grapefruit has become an increasing concern due to reduction in pack-out. Research should be aimed at the factors affecting control of GS rind blotch including spray volume and coverage of fruit, spray frequency and timing, fungicide mode of action, potential for fungal resistance and other pertinent variables.

*Field trials should be conducted for at least 2 years in sites producing a harvestable crop.

PRE-PROPOSAL INSTRUCTIONS

Pre-proposal Submission

The first step in the 2021 RFP is the submission of a pre-proposal. Pre-proposals forms are to be submitted by email at catp@citrusrdf.org, and are **due by 5:00 p.m. Eastern time on Monday, April 26, 2021**

The Pre-proposal form can be downloaded from the following link <http://citrusrdf.org/wp-content/uploads/2021/03/PP-21-Pre-proposal-Form-2021.pdf>

Complete all fields of the Pre-proposal form. Responses to each section must fit into the viewable space.

I. Non-Technical Abstract

For this *non-technical* abstract, please summarize the following information relative to this project:

- A. What is the purpose of this proposed project, and how does it address a specific topic (1-9) listed in the RFP?
- B. What is the practical application of this project's outcomes and how will they benefit the citrus industry? It is not necessary to describe the importance of HLB to world citriculture or how HLB has affected Florida citrus.

II. Objectives and Approach

List the specific objectives of the project with the corresponding hypotheses to be tested.

- A. Briefly describe each objective and the experimental approach to meet each, including methods, assays and technologies.
- B. Briefly summarize the body of knowledge in the literature as it relates specifically to the project objectives.
- C. Describe ongoing or recently completed significant research related to the project objectives especially referencing research accomplishments of co-PIs and collaborators.

III. Timeline and Milestones

- A. Provide a timeline for objectives and milestones and show how progress for each will be determined.
- B. If subsequent objectives rely on the success of a prior objective, describe if/how subsequent objectives can be investigated if early objectives are not met.

IV. Expertise

List 1) the technical requirements and expertise needed to accomplish the project objectives, 2) each investigator's expertise/experience and 3) the available resources/facilities to accomplish the objectives.

V. Expected Results

Provide the following information:

- A. What are the anticipated deliverables of this project in terms of knowledge, recommendations and/or products?
- B. How will the results from this project be applied for the management of citrus, HLB or other relevant diseases?

Save the .pdf file, naming it: *LastName.Initial_Preproposal.pdf*, i.e. *Jones.J_Preproposal.pdf*

Email completed Pre-proposals to catp@citrusrdf.org on or before 5:00 p.m. Eastern time on Monday, April 26, 2021.

All questions should be emailed to catp@citrusrdf.org

The list of Pre-proposals invited to submit Full Proposals will be posted to the citrusrdf.org web page on June 23, 2021.

INSTRUCTIONS FOR FULL PROPOSALS

Invited Full Proposal Submission

Only complete, invited full proposals will be accepted for funding consideration.

The deadline to submit invited Full Proposals is 5:00 p.m. Eastern time on Monday, July 26, 2021. No full proposal Project Narrative may be longer than 7 pages in length, with one-inch margins and no font smaller than 12 may be used.

Plant Improvement Germplasm Evaluation: If your proposal deals with Plant Improvement Germplasm Evaluation, please know that the CRDF Select Committee on Plant Improvement has been working to bring uniformity to the plant breeding programs which CRDF helps to fund. Said uniformity seeks to establish standardized trial design and data collection so that comparisons between different germplasms are easier to make and more helpful to growers. A document entitled "Breeding and Selection Program Outline" has been recommended by the Select Committee and ratified by the CRDF Board of Directors. It may be found at <http://citrusrdf.org/wp-content/uploads/2021/03/Breeding-and-Selection-Outline.pdf>, and proposals will be required to follow said guidelines, if germane.

Content Full Proposal Submission:

All documents described below are required.

There are three documents that comprise the Full Proposal package:

1. **Full Proposal Cover Page and Budget** - Form CB-21 -link to download form: <http://citrusrdf.org/wp-content/uploads/2021/03/CB-21-Cover-Page-and-Budget.pdf>
(5 pages; pdf file. CB-21 does not count in the 7-page limit).
2. **Budget Justification** (Word file; does not count in 7-page Narrative limit)
3. **Project Narrative – 7-page limit of no smaller than 12 font** (Word file)
4. **Subcontract Budget** - Form SC-21 -link to download form: <http://citrusrdf.org/wp-content/uploads/2021/03/SC-21-Subcontract-budget.pdf> (4 pages; pdf file. SC-21 forms do not count in the 7-page limit) - complete if applicable, using a separate form for each proposed subcontract. See detailed instructions later in this file.
5. **Appendices** as outlined below (do not count in the 7-page Narrative limit)

CB-21 Full Proposal Cover Page and Budget Instructions: Form CB-21 does not count towards the 7-page limit of the body of the proposal.

CB-21 Page 1 - Complete all fields on the first page of Form CB-21 -link to downloaded form: <http://citrusrdf.org/wp-content/uploads/2021/03/CB-21-Cover-Page-and-Budget.pdf>

Biohazard Regulation/DNA: If you are working with regulated agents or materials and have an approved IBC plan, check “Yes” to indicate you are in compliance with their guidelines. Otherwise, check “No”.

Today’s Date: Enter the date on which you complete and submit your proposal.

Project Title: Enter the title for your project (from invited preproposal).

Principal Investigator: Enter a single point-of-contact for the Principal Investigator who will be heading the project.

Project #: As shown on posted list of invited pre-proposals.

Email: Use a valid email address for your point-of-contact; this will be the primary means of communication.

Phone: Include your phone number, along with country and city codes.

Organization: Enter the name of the organization through which you are working on this project.

Co-PIs and Collaborators: Enter the names and affiliation of Co-PIs and primary collaborators. Secondary collaborators may be included here if there is sufficient space. A Co-PI is anyone who has a separate budget under the project or otherwise has a significant role in completing the proposed work.

A collaborator may provide advice, materials, or receive materials for analysis.

Collaborators cannot have a budget in the project and they also have no contractual obligation.

Section 11.b (detailed later in the instructions) outlines the Personnel Allocation requirements, which lists the PI, Co-PI’s and Collaborators and each of their roles by Objective; this spreadsheet is not counted in the 7-page limit.

Address: Enter your physical mailing address. This will be a secondary means of contact.

Project Duration (years): Enter the duration of your entire project in years (no more than 3 years).

Total Funds Requested (total project): This field populates automatically from page 2 of Form CB-21. Verify the accuracy of the total funding for your project factoring all years included in Project Duration in \$US. **CRDF does not allow inclusion of indirect costs in project budgets.**

Year 1 Funding Request: This field populates automatically from page 3 of Form CB-21. Verify the accuracy of the Total Direct amount from Page 3 of 5 representing funding you are requesting for the first year of the project in United States currency.

Abstract: Briefly summarize your project (approximately 500 words), including objectives and sufficient detail that will allow reviewers to have a clear idea of your project design and anticipated benefits. Content must fit in the allotted space without scrolling.

CB-21 Instructions for Project Budget Forms Pages 2-5: The Budget pages should be completed along with the Full Proposal Cover page 1. Beginning with the Year 1 Budget on page 3, complete the budget form for each year of the project as designated on Pages 3 to 5. These amounts automatically populate to Page 2 (the cumulative budget for all years of the project). Budget forms do not count towards the 7-page limit of the body of the proposal.

When completing entries for personnel to be employed under this project, consider shifting the salary request to the 2nd quarter of the first year of the project if an employee is a new hire. This will more realistically reflect actual employee costs in the first year of the project. Reasonable cost of living increases may be included in personnel entries in the budget and should be described in the budget justification.

NOTE: Stipends for graduate student involvement in the project should be included as part-time OPS, not staff. In addition, tuition waiver for graduate students is not a personnel expense but, if requested, should be included under “Other Direct” costs.

Requests for travel expense should consider costs of travel related to conducting the research, as well as reasonable expenses related to presenting project results to peers and stakeholders. Details of proposed travel should be provided in the budget narrative. CRDF wishes for the researchers it funds to be part of the national and international research communities and understands that being a part of these communities involves a certain amount of face-to-face interaction. However, international travel is discouraged except in unique circumstances that will be considered on a case-by-case basis. With travel to national conferences, CRDF will consider whether the project will have resulted in data which is mature enough to be shared by the PI in a presentation, and whether more than one person needs to attend when considering such requests.

Do not include purchase of gasoline or vehicle maintenance as travel costs. Instead, include them as Supplies/Materials expenses.

If applicable, the Form SC-21 Subcontract Total Direct (line 21) must be completed for each year of the project. All individual Form SC-21 amounts must be added together and manually inserted into pages 3 to 5 of the Project Budget Forms under Subcontracts (line 17 on CB-21). Verify that all amounts are correct, including Subcontractor total on page 2.

Do not leave any fields blank. Be sure to complete all three yearly budget forms, adding zeroes in any years of the form if needed. This will allow the forms to properly function in calculating sums and transferring values to the composite forms.

Budget Justification (narrative): This is a Word file, saved as a PDF and combined with Form CB-21 (does not count in 7-page Narrative limit). Provide a brief statement that details the following expense categories:

Personnel: Their role and specific responsibilities in the project. Please be certain to rely on your current institutional fringe rates when calculating personnel costs. Except for PI and Co-PI's, list specific position titles instead of employee names unless the individual is critical to the project. Replacement of personnel listed in this section must be pre-approved by CRDF.

NOTE: Stipends for graduate student involvement in the project should be included as part-time OPS, not staff. In addition, tuition waiver for graduate students is not a personnel expense but, if requested, should be included under "Other Direct" costs.

Supplies/Materials: Provide general details of types of supplies and materials that will be utilized for the project and are included in the budget request. This description should demonstrate the need for these expenses to complete the objectives of the proposed research.

Travel: Provide details for in-state and out-of-state travel and purpose of the travel for each trip. Include the number and duration of trips, etc. Do not include fuel or maintenance expenses in in-state travel; move these expenses to the **Supplies/Materials** category.

Subcontracts: Summarize the participation of other institutions or entities that will participate in the project and their required budget. (A separate Form SC-21 [see 8, below] must be completed and submitted for each entity. Each subcontractor should also complete a budget justification.)

Other Direct: Provide justification of all costs shown.

Equipment: Provide details for equipment with cost in excess of \$500. Define the value of the equipment to completion of the project objectives. A specific quote should accompany the proposal.

Project Narrative:

Items 1 – 6 of this section comprise the Narrative and are subject to a 7-page length limit. Submit this document as a PDF file.

1. Current Situation/Literature Review:

- a. What is the purpose of this proposed project and how does it address a specific topic (1-9) listed in the RFP?
- b. Summarize the body of knowledge in the literature as it relates specifically to this project.
- c. Describe and cite ongoing or recently completed significant research related to the proposed project, including the work of co-PIs and collaborators.
- d. Describe preliminary work pertinent to the proposed work. Attach important preliminary data as **appendix i**; appendices will not count towards the 7-page limit.

2. Objectives:

- a. List specific objectives to be accomplished, including the overall goal of the project.
- b. Do subsequent objectives rely on the success of a prior objective? If so, how will this affect the project and how will this be managed?

3. Project Deliverables:

- a. What knowledge, information, recommendations, products or tools will result from this research?
- b. How and when will the results of this research be communicated to growers?
- c. Describe any potential pitfalls and contingencies to achieving progress.

4. Experimental Approach: Provide a description of the project's experimental design.

- a. Non-plant improvement projects that include field trials are required to clearly state:
 - i. Experimental design: Plot size, layout, treatments, blocks, replications and experimental and sampling unit.
 - ii. Site description including the number of sites and criteria for site(s)
 - iii. Application methodology (equipment, coverage, etc.) and timing
 - iv. Data collection: What will be measured, how will it be measured and how often data will be collected.
 - v. Permitting or crop destruction requirements.

5. Project Timeline: Timeline of the project with objective and specific project accomplishments as milestones including subcontractor milestones.

6. Cost/Benefit of Proposed Intervention (if applicable)

7. Bibliography of Literature Cited in the Project Narrative (not included in 7-page limit)

8. SC-21 Subcontract Budget Forms (if applicable):

- a. **Subcontract Budget (Form SC-21)** -link to download form: <http://citrusrdf.org/wp-content/uploads/2021/03/SC-21-Subcontract-budget.pdf> If you have co-PIs (consultants, professional services or institutions) who will receive funds from your project, complete a separate Form SC-21 for each subcontractor from another entity (the budget of cooperators

from your own institution should be included in the main budget). Please complete pages 2-4 of these forms for each year of the subcontract; the cumulative budget will automatically populate on page 1 of SC-21. A budget justification (narrative) for each subcontract budget should be prepared and attached. (These forms are not included in the 7-page limit).

NOTE: The total for each year (1, 2 and 3) of all subcontract budget forms must be added and entered manually into the subcontract field of the project budget (CB-21) form for each corresponding year. If there is more than one subcontractor, verify that all are included in the single Subcontract Total for each year on the CB-21 form. The Subcontract total on page 2 of Form CB-21 should calculate automatically.

NOTE: While many pdf forms can usually be combined into one form, each Form SC-21 must be saved as a separate file to avoid fields being overwritten. Name each file with your name and proposal number, i.e. ***lastname_21-###_SC21[a, b or c as applicable if multiple forms].pdf***

9. Regulatory & Commercialization Considerations: This section is required for all projects developing research concepts, products or tools that are regulated by any state or federal agency and/or have commercialization needs. Applicants must provide evidence that state and federal regulations have been considered and a plan has been developed to improve the likelihood of successful regulatory compliance. The pathway to commercialization of products and tools must also be described to give evidence for the feasibility of commercialization. Please provide the following as **Appendix ii**; this document will not count towards the 7-page limit.

- a. Describe the regulatory requirements of the concept, product or tool during the research and development stage and for implementation.
- b. Describe how this proposal accounts for regulatory considerations, including:
 - i. Acquisition of necessary permits for material movement and trial work
 - ii. SOPs for all pertinent agencies to ensure compliance.
- c. Identify institutional experts, relevant state and federal agencies or regulatory consultants that have been engaged to discuss the regulatory aspect of this research concept.
- d. Describe what will be required to achieve commercialization of project deliverables.
- e. Identify collaborators or consultants who have been engaged with demonstrated expertise in product development and commercialization of this research concept.
- f. Describe intellectual property status including any tools used to develop the product that may affect commercialization.
- g. Describe plans and processes to communicate technology status in reports, presentations and publications without compromising the ability to secure the appropriate patent protection.

Questions regarding regulatory issues may be addressed to aescares@freshfromflorida.com. Commercialization questions should be addressed to institutional offices of technology transfer.

10. Summary of previously CRDF-funded work – If the proposed project is a follow-up to a previous CRDF-funded project, please summarize the following as **Appendix iii**, which will **not** count towards the 7-page limit: Include only work accomplished by you in a previously funded CRDF project.

- a. Title and CRDF number of previous project(s)
- b. Objectives of previous project(s)
- c. Significant results of previous project(s), including publications.

Please note that PIs with any current CRDF funding must be up to date on required project reporting, including quarterly and annual reports, at the time of full proposal review to be considered for 2021 project funding.

11. Current/Pending and Personnel Allocations (Appendix iv)

- a. **Current and Pending Support** -link to download forms: <http://citrusrdf.org/wp-content/uploads/2021/03/Personnel-Allocations-Current-and-Pending-appendix-iv.xls> This excel spreadsheet follows project budget information and is used by reviewers to provide context (and funding detail) of ongoing research by the PI as well as other pending proposals from the team. The purpose of this form is to provide an overview of funding available to the PIs, and to communicate current and planned research that may be related to that proposed to CRDF. The form should be completed with information for each of the PIs who are contributing to the proposal.
- b. **Personnel Allocations Spreadsheet**- link to download forms: <http://citrusrdf.org/wp-content/uploads/2021/03/Personnel-Allocations-Current-and-Pending-appendix-iv.xls> Like the current and pending form, this spreadsheet information is useful to project reviewers and to CRDF to assess level of effort and expertise to meet objectives. List all participants, including the PI, Co-PIs and Collaborators shown on the CB-21 and each of their roles by objective.

Save BOTH tabs of the spreadsheet as a pdf file named as follows:
lastname.21-XXX.appendix iv.pdf

12. Brief resumes with only relevant publications are required for all key personnel. Do not list all your publications; full CVs are not required. Brief resumes should outline the capabilities of those doing the work. Collaborators should be included in key personnel. **(Appendix v)**

13. Institutional Authorization (Appendix vi) -link to download form:

<http://citrusrdf.org/wp-content/uploads/2019/05/Institutional-Authorization-appendix-vi.docx>
This is typically the routing form used by institutions to document review and approval of project proposals prior to their submission. Where available, a copy of the completed institutional authorization form (e.g. UF, IFAS DSR-1) should be included here. All USDA-ARS applicants must submit an approved ARIS form. If your institution does not use such a form, a generic authorization form is provided for your use in the column at the upper left of this page.

14. Letter of authorization from each institution for which a Subcontractor Budget form has been completed **(Appendix vii)**. This statement allows CRDF to know that subcontractors have agreed,

if the project is approved, to complete the objectives with the budget details as provided in the proposal.

15. Provide a statement of commitment from each Co-PI and Collaborator (**Appendix viii**).

16. Other relevant information regarding this proposal should be included here (**Appendix ix**).

Appendices:

Preliminary Data (see 1d)

Regulatory and Commercialization Considerations (see 9)

Summary of previously funded CRDF Projects (see 10)

Current and Pending Support and Personnel Allocations (see 11)

Resumes (see 12)

Institutional Authorization form (see 13)

Authorization Letter from each Subcontractor (see 14)

Statement of commitments from each Co-PI and Collaborator (see 15)

Other Relevant Information (see 16)

Full Proposal Layout Details

Full Proposals should be written in English and submitted as email attachments in Adobe PDF format. Page margins should be one inch on all sides. Use Times New Roman or a similar typeface set to 12-point font and single-line spacing.

Page numbers should be placed on the lower right-hand corner with the Principal Investigator name and the page number (e.g., Robins-2).

Each file submitted as a component of your full proposal should be named with the Principal Investigator name and CRDF-assigned project number provided in your email and form identifier (e.g., *Jones_21-0##_proposal*, *Jones_21-0##_CB21*, *Jones_21-0##_SC21*). When naming files to be included in your Full Proposal submission, avoid using special characters (! @ # \$ % &) in the filename.

Invited Full Proposal packages should be emailed to catp@citrusrdf.org.

Questions may be emailed to catp@citrusrdf.org