



United States Department of Agriculture

Research, Education, and Economics
National Agricultural Research, Extension, Education, and Economics Advisory Board

January 30, 2020

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RE: Citrus Disease Subcommittee's Recommendations for the Priorities, Agenda, and Budget
for the FY2020 Citrus Disease Research and Extension Program

Dear Sirs,

Section 7103 of the Agricultural Act of 2014 (Farm Bill) established the Citrus Disease Subcommittee (CDS) as a permanent subcommittee of the National Agricultural Research, Extension, Education, and Economics (NAREEE) Advisory Board to provide advice and recommendations to USDA to help advance the research and extension capabilities related to citrus diseases. The Agriculture Improvement Act of 2018 reauthorized the committee. The Farm Bill also requires the CDS to complete an annual consultation with the National Institute of Food and Agriculture (NIFA) to: propose a research and extension agenda and annual budgets for the funds made available for the Emergency Citrus Disease Research and Extension Program (ECDRE); recommend annual priorities for the award of the ECDRE grants; and to provide comments on the grants awarded by the ECDRE in the previous fiscal year.

The CDS met on December 4-5, 2019, in Washington, DC to provide their annual consultation with NIFA. This letter is being provided to convey the priorities for the program and allow NIFA to release the Request for Applications (RFA) for the ECDRE program for 2020. The CDS recommends the following overarching goals and desired outcomes for the ECDRE:

- To combat Huanglongbing (HLB) and its disease complex in order to continue to be able to farm citrus in a financially sustainable way through collaborative approaches and knowledge;
- Transition from component-focused research to deploying research outcomes and conclusions on farms; and
- Encourage research teams to bring knowledge together to find grower solutions to combat and prevent HLB infection.

By majority vote, the CDS recommends the following:

- 1) *Agenda*. CDRE funding in FY2020 should continue to focus on the HLB pathosystem.
- 2) *Budget*. NIFA should utilize the total FY 2019 and FY2020 available funding and spend up to \$50M in FY2020.
- 3) *Priorities*. The funding priorities for FY2020 are the following items:
 - Develop a delivery system for therapeutics, nutrition and other HLB solutions
 - Most therapies available now are not adequately delivered via foliar application. The citrus industry needs an engineered delivery system for phloem to access *CLas* systemic infection.
 - Understand the phloem and develop a better understanding of the disease triangle – host, pathogen and vector interaction. Focus on understanding this complex interaction will lead to solutions.
 - *CLas* and therapy movement into and through phloem [biology]
 - Consolidation of screening efforts for intervention targets – reduce candidate lists among groups to those most worthy of advanced testing and commercialization
 - Host plant defense or resistance
 - Asian Citrus Psyllid (ACP) suppression, reduced transmission, or behavior modification (e.g., attract and kill)
 - Pathogen *CLas* titer reduction, competition, or acquisition/transmission prevention
 - Cure infected trees and develop solutions to maintain HLB infected trees [avoiding infection]
 - Nutritional requirements, materials and their deliveries
 - Antimicrobials and their deliveries
 - Commercialize molecules that improve production and implement large scale field trials
 - ACP regional eradication/Psyllid control (commercial and residential)
 - Resistance management
 - Optimize ACP/HLB detection and surveillance/Psyllid attractants – Understanding psyllid movement
 - Early detection for HLB/ *CLas*; Early detection development requires understanding of mechanisms for confident implementation

- Culturing *CLas* bacteria
- Citrus genetic resistance to HLB, including:
 - Traditional breeding
 - Scalable commercial genetic solution for HLB
 - Understanding gene-editing targets and use of CRISPR tools
 - Large scale evaluation of genetic resistance candidates (horticultural performance, marketing, economics)
- Ecological impacts to citrus production, HLB and ACP spread
 - How does the environment and climate effect spread of HLB and ACP, and tree health, etc.?

The CDS recommends that NIFA more fully utilize Coordinated Ag Projects (CAPs) in the FY2020 RFA, a concept presented at the CDS-NIFA consultation by Dr. Parag Chitnis (Associate Director, NIFA). These projects will help to bring together coordinated teams to focus on strategic solutions. **The CDS recommends that the CAP grants should focus on the following subset of the priorities previously identified:**

- ACP regional eradication/Psyllid control (commercial and residential)
 - Resistance management
- Optimize ACP/HLB detection and surveillance/Psyllid attractants – Understanding psyllid movement
 - Early detection for HLB/ *CLas*; Early detection development requires understanding of mechanisms for confident implementation
- Citrus genetic resistance to HLB, including:
 - Traditional breeding
 - Scalable commercial genetic solution for HLB
 - Understanding gene-editing targets and use of CRISPR tools
 - Large scale evaluation of genetic resistance candidates (horticultural performance, marketing, economics)
- Cure infected trees and develop solutions to maintain HLB infected trees [avoiding infection]
 - Nutritional materials and their deliveries
 - Antimicrobials and their deliveries
 - Commercialize molecules that improve production and implement large scale field trials
- Consolidation of screening efforts for intervention targets – reduce candidate lists among groups to those most worthy of advanced testing and commercialization
 - Host plant defense or resistance
 - Asian Citrus Psyllid (ACP) suppression, reduced transmission, or behavior modification (e.g., attract and kill)

- Pathogen *CLas* titer reduction, competition, or acquisition/transmission prevention

As mentioned above, the CDS was strongly in favor of encouraging the use of NIFA's CAP project type as a primary focus for the 2020 ECDRE RFA. After more than a decade of research investment in the USA and abroad towards solutions to HLB, many aspects of the disease system involving citrus host plant, bacterial pathogen and insect vector have been deeply studied, and in large part, individual component research has advanced across the board. That is why the CDS emphasized the need now for integrating these findings into field application and adoption projects and proposed the specific priority topics for which the use of the coordinated approach should be most beneficial. During discussions, the CDS recognized that the potential applicant community needs assistance in understanding and responding to the CAP emphasis in the 2020 CDRE, as there is additional planning, management and stakeholder involvement in developing a competitive and successful CAP application. It is for this reason that the **CDS recommends for NIFA to conduct CAP-specific training as the CDRE RFA is announced to allow potential applicants to become more familiar with the increased complexity of this coordinated team project type in the form of workshops, training sessions, and information dissemination.** Referencing the currently available [instructions](#) (page 10) to applicants regarding the CAP project type is helpful, but not adequate to prepare applicants to develop a successful CAP application.

CAP grants are typically larger projects with more funding allocated. If NIFA proceeds to accept the advice of the CDS and award more CAP grants in the coming funding cycle, additional oversight and accountability must be applied to the ongoing progress review of these types of awards. **The CDS recommends that NIFA implement an independent review team that brings its findings on the status and progress of the CAPs to the CDS at its annual meeting as part of CDRE project evaluation.**

In order to generally strengthen the quality of grants awarded through the ECDRE program, the CDS members expressed strong interest in having a greater role in the decision-making and review processes of the program. **The CDS recommends that NIFA identify how the CDS members can provide more useful input on which projects are funded** going beyond simply recommending which general categories of research should receive funding, perhaps through a supplemental role in the Relevancy Review process.

The CDS further expressed deep interest for the subcommittee to have greater input after the Relevancy Review and before the awards are made. Currently, the proposals are first reviewed by industry-led relevancy review panels then go through a scientific merit review. **The CDS recommends that NIFA evaluate how to better incorporate their expertise into the review after the relevancy review and before awards are completed.**

In addition to the annual consultation with NIFA, the CDS is charged with providing overarching advice and recommendations on the research, education, and economics issues impacting citrus

diseases. Prior to the Dec 2019 CDS-NIFA consultation, the Foundation for Food and Agricultural Research (FFAR) convened a group of scientists and citrus growers to discuss the major issues impacting citrus disease research. The members of the CDS attended the convening.

CDS recommends that the coordinating authority within the existing MAC structure be strengthened. During the CDS meeting and the FFAR Citrus Greening Convening, it was acknowledged that more improved coordination across all funding entities – including federal and state – was ranked as a highest priority. Funding is being utilized from NIFA, the Agricultural Research Service, the Animal and Plant Health Inspection Service, and industry research groups in California and Florida to seek an HLB solution. And better coordination of all research efforts is needed to solve this complex issue affecting the U.S. citrus industry.

In order to assist with better coordination across all state and federal funding agencies, **the CDS recommends that the HLB MAC identify a way to fund (or develop) a central, searchable database of all citrus greening research – both past and current, and research funded federally and by states – including project inventory and reporting, to be hosted and maintained at either the California Citrus Research Board or the Citrus Research and Development Foundation (CRDF).** It is imperative for the citrus research community to have access to past and ongoing research activities to avoid duplication, improve upon past research efforts, and identify potential collaboration opportunities.

Even though the industry acknowledges that HLB has reached epidemic proportions across Florida, estimates of the level of infection and its impact on citrus operations across the country are scarce¹. In order to better understand, **the CDS recommends that the Economic Research Service conduct a study of the economic impact of HLB and what needs to be accomplished in the next 10 years to help identify the effects of HLB's impacts on this important U.S. horticultural crop.**

We ask that these recommendations are appropriately conveyed for inclusion and consideration in the FY2020 ECDRE RFA and program. On behalf of the CDS, we look forward to our continued work and collaboration on this important issue. If you have any questions or need additional information, please contact Michele Esch, Executive Director of the NAREEE Advisory Board at (202) 720-8408 or michele.esch@usda.gov.

Sincerely,



David Baltensperger
Chair, NAREEE Advisory Board



Justin Brown
Chair, Citrus Disease Subcommittee

¹ Impact of Citrus Greening on Citrus Operations in Florida <https://edis.ifas.ufl.edu/fe983>