



CITRUS RESEARCH & DEVELOPMENT FOUNDATION GROWER RESEARCH REPORT

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CRDF Addresses Gaps in Citrus Research Portfolio

A CRDF committee recently completed an extensive analysis of gaps in the industry's research portfolio and determined a handful of priorities including investigating alternative utilizations of HLB infected fruit.

Over the past nine months, the CRDF's Industry Research Coordinating Committee met several times to perform the gap analysis. The process included consultations with various industry segments, including growers, nurseries, harvesters, processors and fresh fruit packers

The IRCC, chaired by grower Wayne Simmons, is responsible for recommending the research priorities to the full CRDF Board. The gap analysis leads to identification of priority areas that require attention, and for each gap, an action plan can then be developed. The following five steps guided the analysis:

- Organize citrus research priority input from all sectors of the industry
- Assemble an inventory of current research projects related to citrus (focus on Florida, but with information from federal as well as Texas and California citrus efforts)
- Review priorities versus level of effort (inventory) and identify gaps
- Discuss each gap and characterize needed actions
- Assist in implementing the actions approved by the CRDF Board of Directors.

Below are some of the most urgent gaps identified by the IRCC. For a full explanation of the ranking and methodology go to the IRCC page at <http://citrusrdf.org/committees/industry-research-coordination-committee>

Gap 1 - Citrus HLB (Greening): With the continuing epidemic of HLB expanding in Florida's mature tree inventory, declines in productivity continue. Despite an array of previous and current research projects, the results to date have not successfully addressed the decline in productivity that affects growers, processors, packers and all aspects of the industry.

Upcoming Board & Committee Meetings

Most meetings are held in the Ben Hill Griffin Hall at the UF-IFAS, CREC campus in Lake Alfred, Florida.

02/21/2017	Research Management Comm.	9:30 am
02/22/2017	Commercial Product Delivery Comm.	9:30 am
02/28/2017	Governance Committee (Ft. Pierce)	8:30 am
02/28/2017	Board of Directors (Ft. Pierce)	9:30 am
03/15 - 03/17/2017	IRCHLB Conference (Orlando)	

Discussion: While there are approximately 210 research projects listed in the U.S. Citrus Research Inventory assigned to the topic of HLB, the collective tools that have emerged to date are not adequate to stabilize and restore health to the current tree inventory in Florida. This gap can be described several ways, but includes the need to deliver useful information on which tactics will lead to improved returns to growers though improved productivity, and to take all steps to accelerate this process towards additional tactic delivery.

Action: Establish improved productivity as an overarching factor as research project results are evaluated and decisions are made on subsequent research and delivery programs. Prioritize research that is likely to directly affect productivity. Deliver the planned grower play book as soon as possible to guide growers in use of the best available tactics.

GAP 2 - Culturing CLAs as an important tool for developing solutions to HLB.

Discussion: The inability to culture the causal agent of HLB has limited research progress. Although there are continuing efforts funded by the USDA and CRDF, limited progress has been made that will provide this research tool to the community.

Action: A concerted effort should be made to learn from culturing efforts to date and foster an organized approach to achieve this goal. The NAS study should be encouraged to recommend how to accelerate current efforts to culture the bacteria.

GAP 3 - Rainfastness of PFD treatment products for use in preventing PFD losses at bloom.

(continued on page 2.)



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Page 2

(continued from page 1.)

Discussion: Research here in Florida and in other locations (e.g., Brazil) have demonstrated the critical importance of delivering fungicides to citrus during vulnerable periods to prevent widespread infection by *Colletotrichum*, leading to PFD. A range of materials are available, and previous research has pinpointed the relationship between bloom phenology, timing of rainfall events, and the incidence of disease. Control recommendations highlight the need to place fungicides on susceptible flower tissues at precise times, often coincident with rainfall. Seeking rainfast products may be as important as expanding the breadth of products available to suppress PFD.

Action: Developing formulations or specific products that were rainfast would greatly expand the ability of growers to control PFD during infection periods. The extended period of effectiveness is one benefit, but also the ability to apply immediately prior to rainfall episodes would strengthen grower ability to protect larger acreage.

GAP 4 - Citrus Black Spot life cycle and epidemiology as it affects both spread dynamics and treatment development and recommendations. Impact of single infected tree. Better detection of ascospores to confirm life cycle. Cooperation with Brazil in evolution of management tools and epidemiology.

Discussion: Citrus Black Spot has continued to expand in Florida, although at a controlled rate. The pattern of spread experience in Brazil predicts that more aggressive expansion might be expected at some point. Current regulatory and grower initiated practices are in place to slow the spread, but advanced understanding of the disease in Florida might better inform if we are doing enough/too much to interfere with disease spread. Research results from Florida indicate unique characteristics of the pathogen here, and additional research may clarify what this means in terms of spread dynamics and control.

Action: Engage the new group of plant pathologists to join with current researchers (primarily Dr. Megan Dewdney) to expand the research goals to include addressing the issues identified here. Having science-based information to assist regulatory action is vital. It is recommended that international counterparts be engaged in planning and serve in cooperative roles in ensuing research. Brazilian citrus scientists and growers have been addressing CBS for a lengthy period, and we should formalize the relationships to learn from their experiences.

GAP 5 - Integrated Pest Management to develop rust mite control under intense psyllid control. Limited materials available, poten-

tial resistance.

Discussion: The situation with citrus rust mite in Florida has been largely ignored from a research perspective since HLB took center stage. Despite that shift, injury and losses to rust mite continue. HLB interventions in general do not automatically cover rust mite management needs, and in an environment where input costs are escalated, rust mite management has not kept pace. The issues of limited materials available and the potential for resistance development are among the targets for further research.

Action: Establish a rust mite working group to investigate, update, define recommendations in the presence of HLB and current pest/disease treatments. This group of researchers, production managers, and perhaps registrants could define opportunities and needs, and might encourage a group effort leading to a set of rust mite research priorities.

GAP 6 - Develop a rapid response/proactive approach to future exotic pests and diseases, with particular focus on Citrus Leprosis and Citrus Variegated Chlorosis (CVC).

Discussion: Use of multi-pest survey to address these (and other) diseases has been a component of CHRP, but this may need to be strengthened. There also is a need to increase local awareness of exotic diseases, including the disease biology/epidemiology, as well as practices and treatments that might be applied if disease occurs. We have learned with HLB that proactive information gathering will contribute to a quicker response.

Action: Knowing that exotic citrus pests and diseases are on the move, and include serious diseases such as CVC and Leprosis, Florida citrus should organize a more comprehensive proactive program for exotics. This effort necessarily needs to be multi-agency, and through research should import knowledge from other industries impacted by the target diseases. Research collaboration/participation in areas of occurrence of target exotics is one way to address the needs of Florida. Results should include advanced recommendations for early response to an exotic find, and should offer pre-emptive next steps to respond to a detection in Florida. Numerous mechanisms exist to strengthen preparation for a new disease find, and they should be employed to bring together the appropriate components to address this need.