



An Update on HLB: Science to Solutions

**Presented to
Citrus Expo
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HLB Research Overview

- Industry has continued focused effort on HLB
- Projects address short- to long-term goals
- Financial support from growers and others
- 2013-14 State Legislative support \$8 million
- Research and delivery progress

Research Management Committee

- Bobby Barben, *Chair*
- Tom Jerkins
- Wayne Simmons
- Bill Barber
- Larry Davis
- Steve Farr
- David Howard
- Peter McClure
- John Merritt
- Tim Dooley
- Jim Snively
- George Walker

Support to the Research Management Committee

Research Program Manager

Scientific Advisory Board (SAB)

Ad hoc Scientific Reviewers

Commercial Product Development Committee

- Ben McLean III, Chair
- Ricke Kress
- Jerry Newlin
- Shannon Shepp
- Bob Stambaugh
- Hugh Thompson
- Mary Duryea
-

NON-BOARD MEMBERS:

- Tim Anglea
- Mark Colbert
- Peter McClure
- Andy Rackley

Support to the Product Development Committee
Product Development Program Manager

Industry Research Coordinating Committee

- Wayne Simmons, Chair
- Mark Colbert
- Peter McClure
- Tim Anglea
- Kevin Gaffney
- Mitch Willis
- John Veldhius
- Paul Genke
- Carson Futch
- Paul Meador
- V. C. Hollingsworth
- Frank Hunt, III
- Tom Kirschner
- Phil Rucks

Primary Activities

Establish Citrus Research Priorities

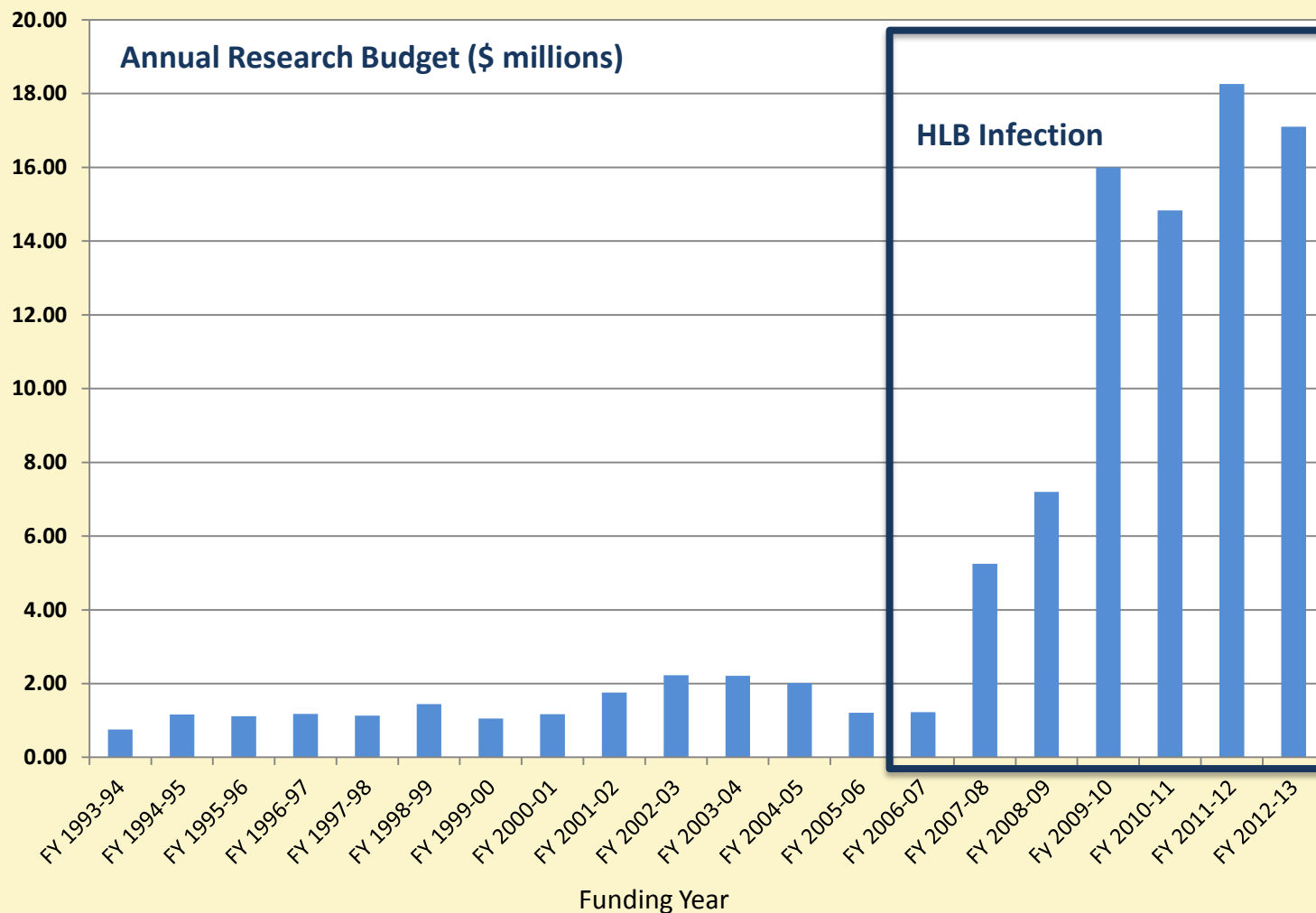
Generate Annual Research Project Inventory

Conduct Gaps Analysis – What isn't being done?

HLB Research Goals

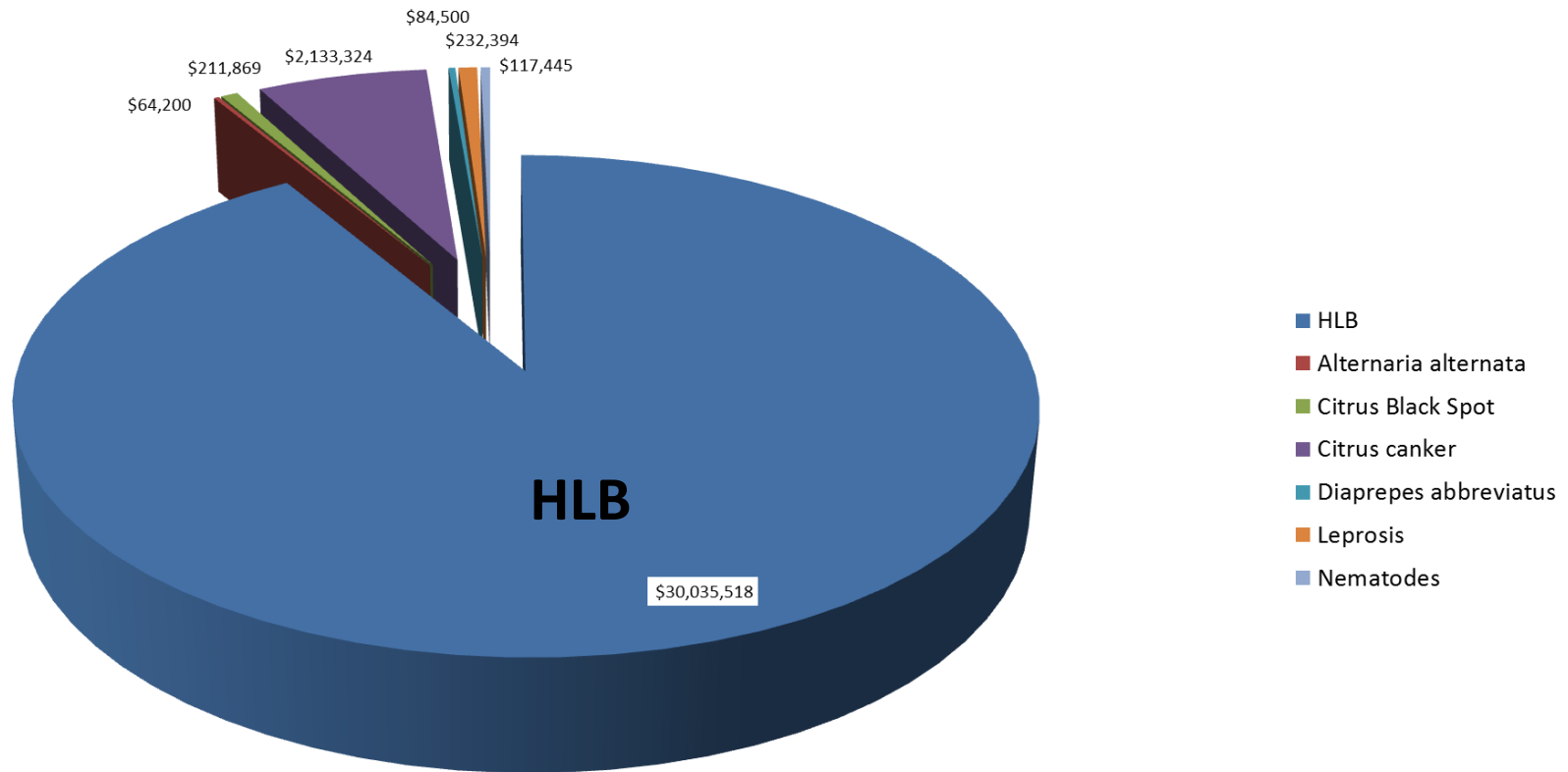
- **Goals for Research: Short Term**
 - Preserve capacity of current tree inventory
 - Preserve fruit marketing opportunities
 - Enable replanting to renew tree inventory
- **Goals for Research: Long Term**
 - Resistant Plants and durable management tools
 - Less reliance on increased inputs
 - Return to managing citrus, not HLB
- **Delivery of Solutions to Growers**

Citrus Industry Research Expense Summary - Historical



CRDF Overview of the CRDF Research Program

HLB, disease portfolio of 114 research projects



Research Projects at a Glance

- Current portfolio of about 140 projects
- FY2013-14 continuing costs - \$15.6 million
- State Legislative Initiative
- Research Project Enhancements
 - Accelerate short-term completion and delivery
 - Review current projects for opportunities to expand progress
- Commercial Product Delivery Projects

Ultimate HLB Management

**Asian Citrus Psyllid
Population**

Pesticides
Novel Suppression
Biological Control
Attract/Repel
Defective ACP
CHMAs

**Clas Bacterial
Inneculum**

Better Detection
Tree Removal
Antimicrobials
Tree Defense
Thermal Therapy
Other Therapy

**Tree Susceptibility
To HLB and Injury**

Optimal Nutrition/Irrigation
Tolerant Rootstocks
Increase Plant Defense
Breeding for Resistance
Incorporate Anti-HLB genes
Accelerate Production
Replant Citrus Trees



Low

Transmission

X



Low

Infection

X



Low

Tree Injury

=

**Reduced HLB
Disease
Severity**

Near-Term Project Areas

- **Citrus Health Management Areas and vector management**
- **Therapy for infected trees**
 - Anti-Microbial chemicals
 - Heat Therapy of infected trees
- **Plant Growth Regulators to Reduce Fruit Drop**
- **HLB Tolerance and citrus breeding**
 - Tolerant rootstocks
 - Tolerant scions
 - HLB Escapes
- **Enhanced Nutrition and Integrated Management**
- **Many of these project areas are presented here at Expo**

Citrus Health Management Areas (CHMAs)

An Outstanding Partnership Between USDA/APHIS, Florida Department of Agriculture, the University of Florida, IFAS and Citrus Growers

CHMAs are making a difference in managing ACP! Further improvement can be expected with feedback from ACP counts, broader participation

The CHMA principles encourage highest use of available tools, particularly those associated with vector management at present

Well-Suited for implementation of additional tools as they emerge

CRDF will utilize CHMAs when possible to deliver solutions – Growers should too!

Project Enhancements FY2013-14

Neonicotinoids & other Insecticides for Asian Citrus Psyllid

- CRDF Background investment: Considerable investment since initiation of HLB response.
- Products, rates, timing, ACP response
- CRDF working with registrants, FDACS and EPA to consider expanded use of ACP insecticides, including new a.i.'s
- Opportunity to add new tools, including those that protect from overuse such as resistance management
- Work continues on attractants and repellents
- Biological control, including fungal pathogens of ACP

Program Enhancements FY2013-14

Antimicrobial Therapy

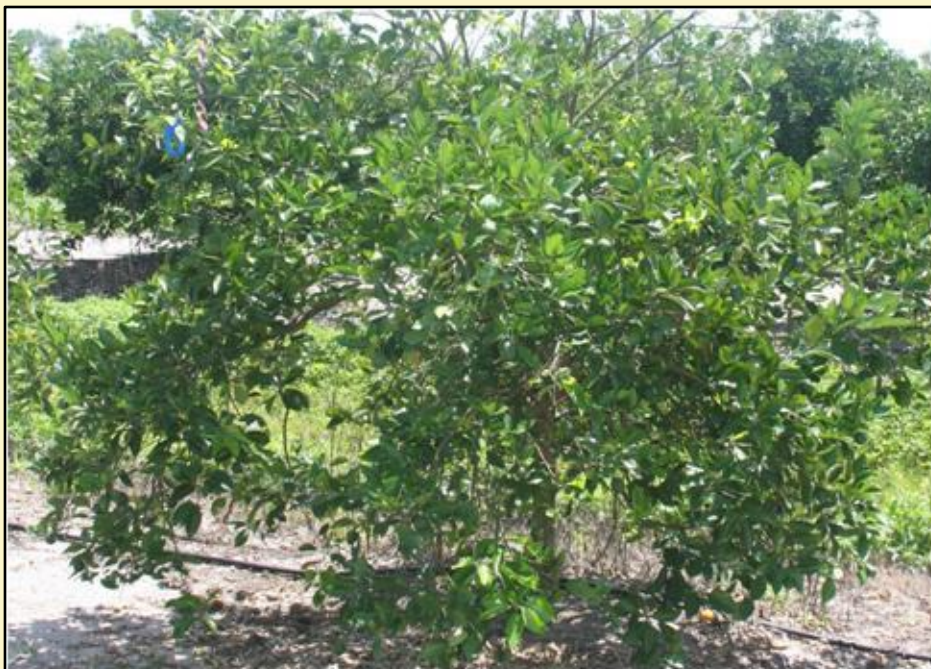
- CRDF Background investment: CRDF-funded anti-microbial screens has enabled comparative data on a long list of candidate materials
- Recent research also has focused on development of methods to evaluate soil microbial materials for their effects on HLB/citrus roots.
- Expansion of lab capacity to evaluate additional candidate materials
- Consideration of field trials for selective candidates
- 3rd party assistance is being sought for regulatory environment and roadmaps and candidate commercial partners are being identified

Program Enhancements FY2013-14

Thermal Therapy Field tests

- CRDF Background investment: A current project is focused on evaluating thermal conditions that may lower CLas titer in infected field-planted trees. Similarly, a two-year Specialty Crop Block Grant Project also is investigating this potential at USDA, ARS.
- Refine Heat Requirements (temperature and time)
- Field trials with low-tech solutions- NOW!
- Develop more technical heat treatment options, including full row tree treatment

Field Trial – Heat Treatment



Before



8 months later

Source: Ping Duan, USDA, ARS

Program Enhancements FY2013-14

Plant Growth Regulators and Fruit Drop

- CRDF Background investment: Evaluate the role of PGRs on growth of phloem in HLB-infected trees, and possible implications for fruit drop.
- Other funded research has provided methods to evaluate and quantify phloem dynamics.
- Enhancements include an additional field trial with PGRs
- Possible new research on fruit drop may be suggested by examination of current PGR labels.
- Based on research results, it may be possible to first evaluate, then launch label change efforts

Support for New Plantings

- Rootstock/Scion
- Location of plantings
- Management of HLB
- Quality nursery stock
- Aggressive early growth
- Psyllid Management
- Intensive Production



Potential Enhancements FY2013-14

Rootstocks for New Plantings

- CRDF Background investment: Significant investment in UF and USDA citrus breeding programs has set the stage for the field evaluation of rootstock genotypes under severe HLB pressure
- UF and USDA already have made arrangements with growers for additional field trials
- Near term expansion
 - Facilitation of propagation of promising rootstock candidates for near-term large scale grower field trials.
 - In addition, address availability of rootstock propagation materials
- Other new plantings initiatives

Program Enhancements FY2013-14

Poncirus-Based HLB-Tolerant Scions

- CRDF Background investment: Ongoing UF and USDA scion development research projects hold promise for candidate HLB-resistant scions.
- Identification of need for additional effort to accelerate availability of these materials
- Consider additional field trials and fruit quality assessments

Program Enhancements FY2013-14

HLB Escapes

- CRDF Background investment: Investigate potential surviving genotypes of citrus in areas of China and India. Current project focuses on investigating occurrence of HLB escapes in Florida
- Provide support, as required, to assist researchers and citrus extension agents in overcoming barriers to successful implementation of escape trees process. CHRP program also is involved in following up on escapes
- Expand soil microbial testing capacity
- A mechanism is in place – Contact your Extension Agent to report an interesting “Survivor” observation

Program Enhancements FY2013-14

Enhanced Nutritional Programs

- CRDF Background investment: Current investment to date on nutrition in relation to HLB includes 21 projects for an investment of over \$4.8 million.
- White paper summarizing ENP research – citrusrdf.org
- A project seeks to capture grower trial results, and to determine the most valuable components of ENPs that influence tree health.
- Additional efforts to evaluate the role of nutrition in health of HLB-infected trees are being considered

Summary of Grower Tools

- Psyllid Management
- Good Cultural Practices, including Resets
- Therapy for infected plants
- Replanting of new blocks
- Use of best plant materials – Tolerant Rootstocks
- Readily adopt new tools as they are delivered

Looking Forward - CPD

- Looking for projects to move forward
 - From research project results
 - From outside sources
 - Adaptation from other uses/crops
 - Submission of new solution ideas (e.g., Innocentive)
- Removing Obstacles – Research, Regulatory
- Funding Enhancement – Legislative Funds is helping move to field trials

CRDF Website

- Approved Research Projects List
- Individual Projects – Progress Reports
- Notice and Process for New Pre-Proposals
- 2011-12 Research Gaps Analysis Report
- Commercial Product Development Projects
- Newsletters, other updates

CRDF is proud to provide support to the industry



Thank you!