

**Citrus Research and Development Foundation, Inc.**

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# **Tools to Fund Agricultural Research The Citrus Industry Model**

**Farm Foundation Forum  
January 28, 2015**

**Harold Browning, Chief Operations Officer**

# Topics

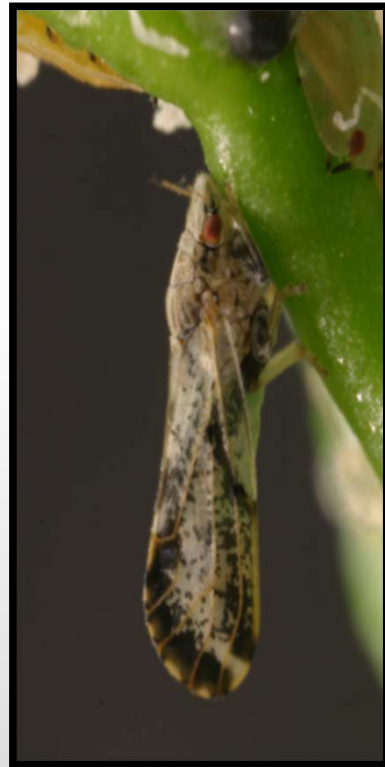
- Perspective: The Florida Citrus Industry and Huanglongbing Disease
- Emergence of the Citrus Research and Development Foundation, Inc.
  - Structure and Purpose
  - Processes
  - Funding and Funds Management
- Is this model working?
- Interface of CRDF with other Ag Research Funding Organizations
- Benefits of Industry-Organized and Managed Research
- Challenges in the Private Industry Model

# Profile: Florida Citrus Industry at Risk

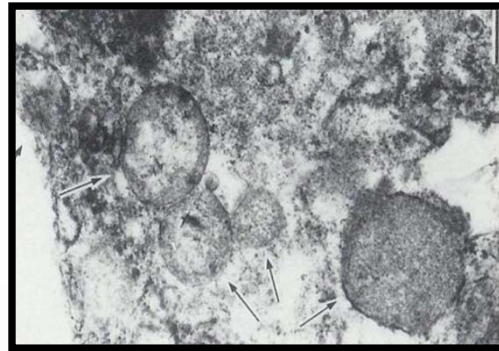


- Nearly 550,000 acres
- Juice and Fresh Marketing
- 34 producing counties
- 6,000 small and large growers
- 76,000 employees
- 160-180 million boxes of fruit
- \$1.2 billion farm gate value
- \$8.9 billion economic impact
- Supplies 90% of U.S. OJ
- National Industry – CA, TX, AZ

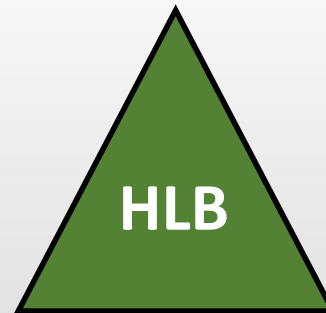
# The Huanglongbing (HLB) Disease Triangle



**Asian citrus psyllid**  
**Vector (1998)**



***CLas* Bacteria**  
**Pathogen (2005)**



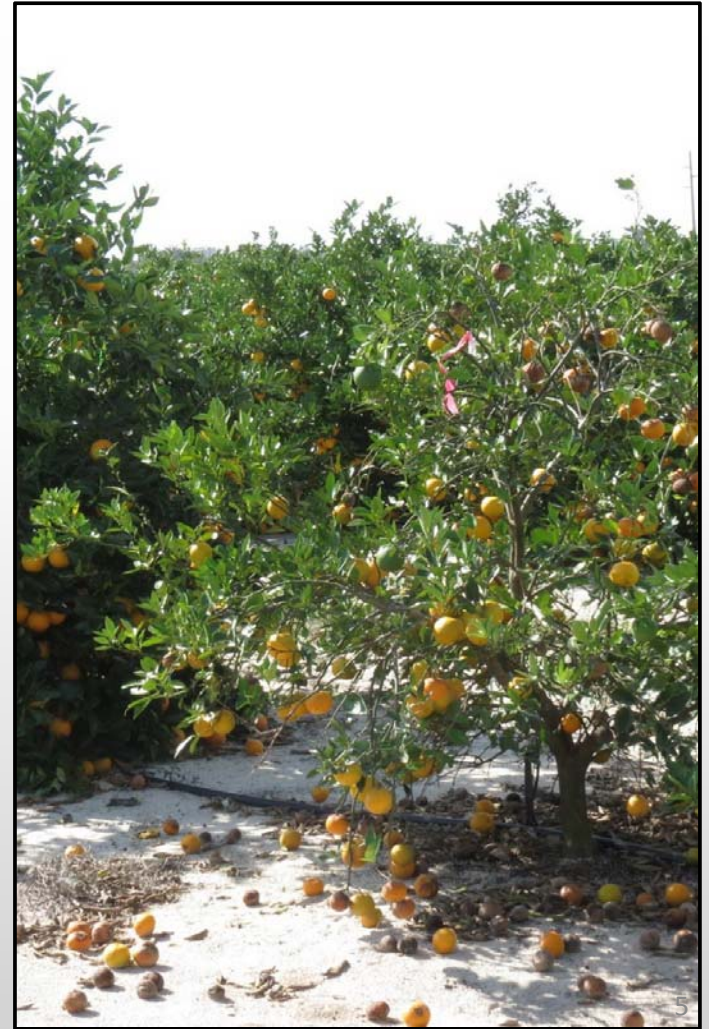
**Citrus Tree**  
**Host (>200 years)**



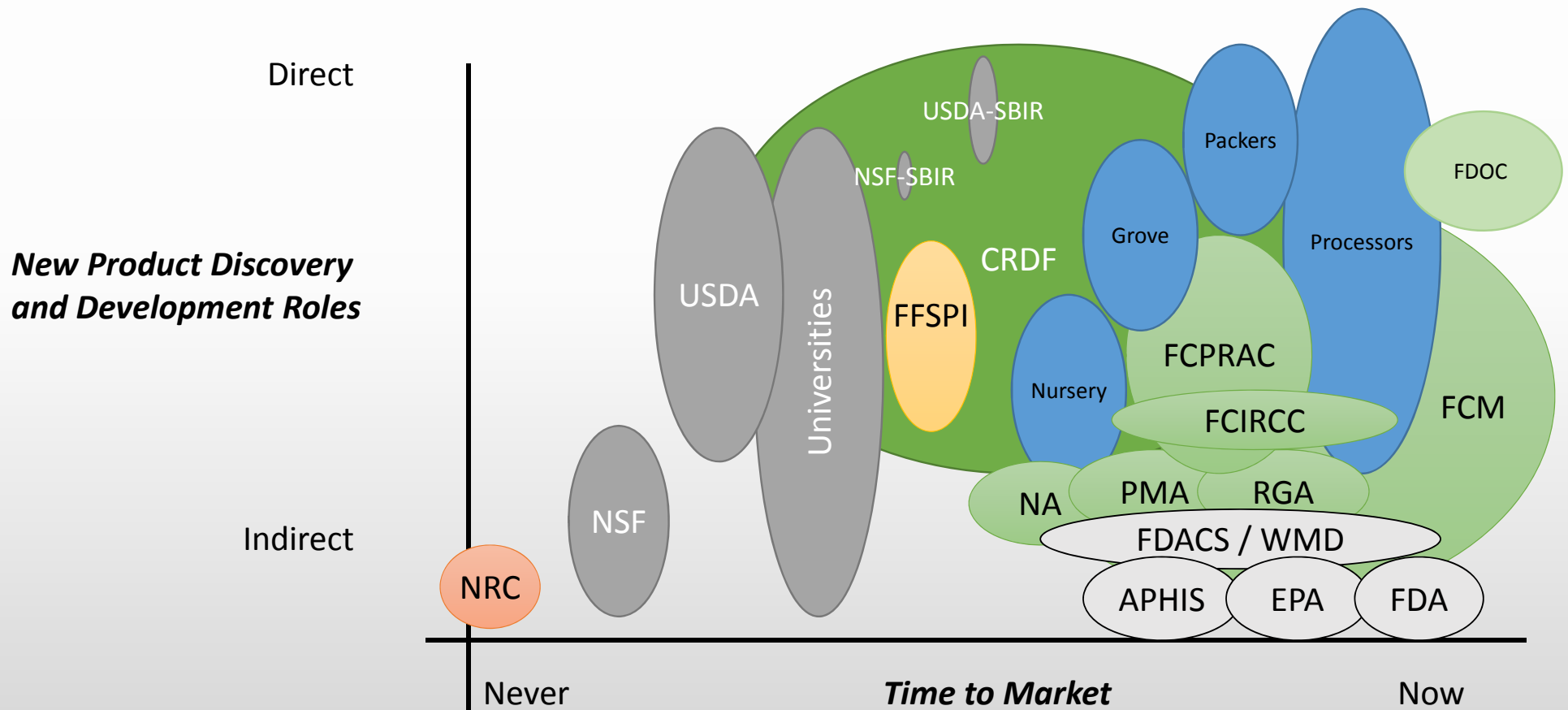
# Progressive Biological Impacts of HLB: 2005-2014

TIME  
↓

- Inoculation into Leaves by Psyllid
- Systemic Movement in Vascular Tissue
- Mottling of Leaves (starch)
- Debilitation of Root Systems
- Decline of Limbs, Thinning of Canopies
- Small, Off-flavored Fruit
- Pre-harvest Fruit Drop Increase
- Overall Tree Decline
- Increasingly Compounded by Other Stresses
- Individual Grove Failure



# How to Mobilize a Response Within a Segmented Industry and System



# Assistance in Developing a Response to HLB

- Planning: A Critical Element
- 2008 NAS-NRC Planning
- 2010 NRC Study Published  
<http://www.nap.edu/catalog/12880/> (328 pages)
- CRDF Formed as Non-Profit Research Sponsor

## STRATEGIC PLANNING FOR THE FLORIDA CITRUS INDUSTRY Addressing Citrus Greening Disease



NATIONAL RESEARCH COUNCIL  
OF THE NATIONAL ACADEMIES

## Structure of CRDF

- “Identify one organization and empower it to have oversight responsibility over HLB research and Development Efforts” NRC 2010
- Organized as a 501(c)(3) NFP under University of Florida (DSO)
- Governed by State Statutes for Non-profits
- 13-member Board Primarily Composed of Citrus Industry Members
- 6 Committees Provide Oversight and Recommendations to Board
- Meetings Publically Noticed and Open to Public
- Monthly Board Meetings Since 2009
- Management Staff of 4: Contractors Conduct Research, Delivery and Other Support



# Purpose of CRDF

*“Advance disease and production research and product development activities to ensure the survival and competitiveness of Florida citrus”*

Seek solutions to HLB via

- Industry Research Coordination Committee - priorities
- Research Management Committee: Open call competitive grant program –
  - 2 levels peer review with board final decisions
- Commercial Product Delivery Facilitation – invited proposals, advisors review, board final decision
- Successful proposals are contracted for 1-3 years
- Scientists and solvers in 27 states, 5 countries have been supported
- Typical portfolio is 125-150 active projects

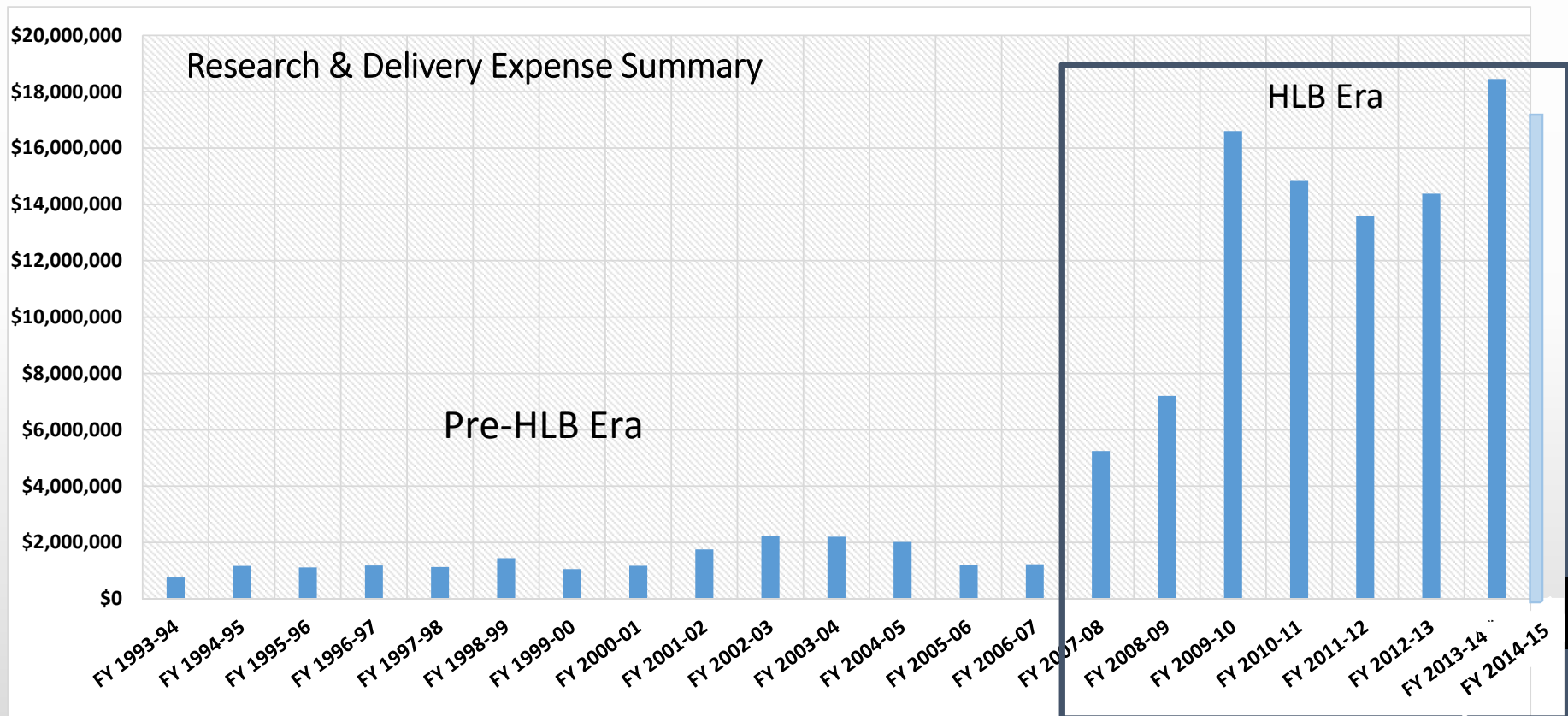
# **Funding the CRDF Mission**

## **Sources of Funding to Drive Solutions to HLB**

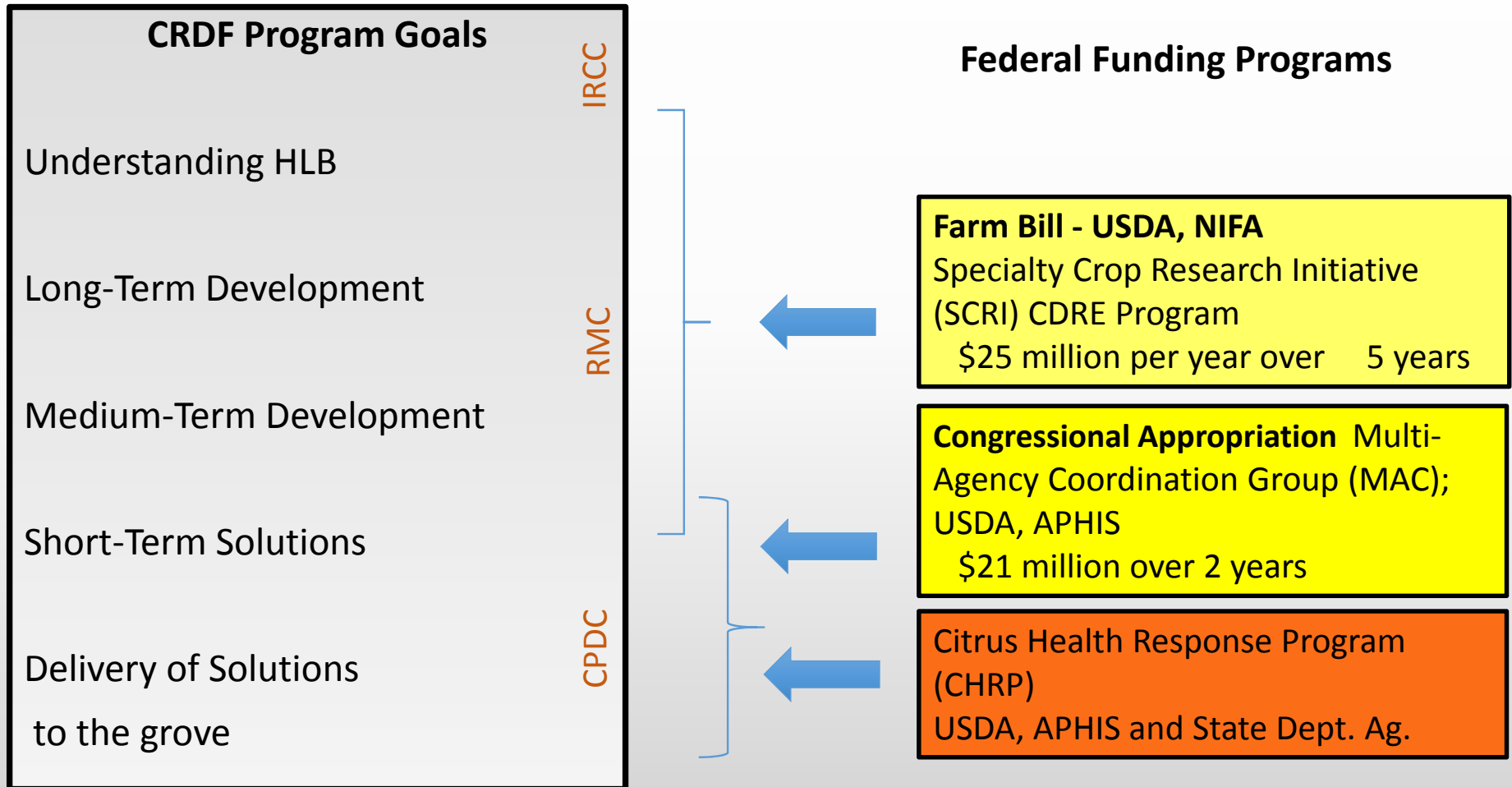
- **State Marketing Order – Mandatory tax on harvested boxes of fruit**
  - Florida Citrus Production Research Box Tax ( \$.03/box)
  - Florida Department of Citrus Marketing and Promotion Box Tax (\$.05-.30/box)
- **Donor Contributions**
  - \$0.5 to \$1.5 million per year
- **Government Funding**
  - State Legislature – Appropriations through Florida Dept. Agriculture
  - Federal Funding
    - USDA, ARS Specific Cooperative Agreement (SCA)
    - USDA, NIFA, SCRI Competitive Grant: CRDF Project Management – Grant Agreement
    - USDA, APHIS, MAC Group: Funds to support “shovel-ready projects” – SCA
- **One-Year Sponsor Contracts are Standard**



# Citrus Industry Research Investments (CRDF)



# CRDF and Federal Funding Programs – HLB





# Benefits of Industry- Organized and Managed Research

- True private/public partnership “from bottom up”
- Needs-driven focus on solutions to the HLB crisis
- Shared governance
- Flexible funding: direct to specific needs
- Engage public/private entities in discovery > problem solving > delivery
- Real-time reporting and feedback
- Flexibility to alter directions
- Facilitation of hand-off steps
- Open process allows all partners to be aware

## **Contributions to Basic Science**

- Genomes of citrus, psyllid, bacterial
- Gene Expression Studies
- Culturing recalcitrant bacteria
- Epidemiology of exotic disease
- Host plant/pathogen/vector relationships
- Vector transmission and endosymbionts
- Targets for bacterial intervention

# Evaluation of Near-Commercial Tools

- Commercial Tools to Reduce Vector Insect Populations
- Chemical and Thermal Therapy to Reduce Bacteria in Trees
- Naturally Occurring Microbial Products
- Plant Growth Regulators - Fruit Drop due to HLB
- Field Trials of Integrated Practices - Root Health
  - Organic Compost
  - Organic Acids
  - Acidification of Irrigation Water and Soil
- Field Delivery of Tolerant or Resistant Citrus Germplasm
- Evaluation of Advanced Citrus Production Systems
- Inoculum Removal
  - Demonstration of Benefit of Removal
  - Motivate Larger Scale Inoculum Removal

# Challenges in the Private/Public Model

- Stability of private/public funds – e.g., declining production
- Tendency to focus on near-term: Long-term goals needed
- Focus is not on fundamental science
- Regional differences in need/timelines cause disconnects, even within one commodity
- Perceived lack of timely progress jeopardizes long-term sustainability
- Limited scope of funding compared to large government funding programs
- What happens when the current crisis is averted?





Citrus Research and Development Foundation, Inc.

# Thank you!



**CRDF is proud to provide support to the Florida citrus industry**