

Developing Citrus Health Management Areas

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Why develop CHMA's ?

- **Preserve current citrus grove acreage**
- **Slow the spread of HLB**
 - Improve psyllid control
- **Facilitate adoption of new technology to better manage HLB**
- **Prolong the usefulness of our current management tools**
 - Development of pesticide resistance

Strategic Planning for the Florida Citrus Industry Addressing Citrus Greening Disease

Citrus greening, a disease that reduces yield, compromises the flavor, color, and size of citrus fruit and eventually kills the citrus tree, is now present in all 34 Floridian citrus-producing counties. Caused by an insect-spread bacterial infection, the disease reduced citrus production in 2008 by several percent and continues to spread, threatening the existence of Florida's \$9.3 billion citrus industry. A successful citrus greening response will focus on earlier detection of diseased trees, so that these sources of new infections can be removed more quickly, and on new methods to control the insects that carry the bacteria. In the longer-term, technologies such as genomics could be used to develop new citrus strains that are resistant to both the bacteria and the insect.

Among the many citrus diseases that have invaded Florida, citrus greening, known in the international scientific community as Huanglongbing or HLB, presents the greatest threat to Florida's citrus industry. Citrus greening infects every type of citrus, and can quickly spread from one tree to a whole orchard. Infected trees yield fewer fruit, and the fruit that is produced is small, lopsided, green in color, and has a bitter flavor, rendering it unusable. There is no cure for citrus greening disease.



In Florida, citrus greening is universally associated with the bacterium *Candidatus Liberibacter asiaticus*, which is spread by an insect called the Asian citrus psyllid (pronounced "sill-id"). First detected in the United States in Florida in 2005, the disease has spread throughout Florida's citrus-producing counties and has also been reported in Texas, Georgia, Louisiana, and South Carolina. By 2008, the removal of infected

trees and the adverse effects of the infection had reduced Florida citrus production by several percent. The rapid spread of the disease threatens continued reductions in the future.

The incursion of citrus greening disease has been more effective than any prior event in bringing industry, government, and universities together in the defense of citrus production in Florida. Local, state and international meetings have been organized to educate citrus growers about the disease, and increased industry and government research efforts have yielded insight into citrus greening that could result in the development of new disease and insect control strategies. However, there is an urgent need to identify immediate actions to keep the citrus industry viable while new approaches for long-term disease mitigation are developed.

At the request of the Florida Department of Citrus, the National Research Council convened a committee to develop a strategic

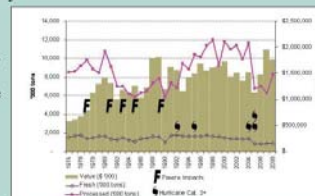
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The Citrus Industry

Citrus fruit ranks as first internationally in trade value among all fruits and is produced commercially in about 140 countries, but the primary citrus producers are Brazil, the Mediterranean Basin, the United States, and China. In the United States, Florida (68.7 percent), California (27.5 percent) and Texas (2.7 percent) and Arizona (1.1 percent) produce almost the entire commercial citrus crop. Brazil and Florida dominate the production of oranges for juice, and Florida's hot, humid climate is perfect for producing oranges with high juice content.

The Florida citrus industry is estimated to have a \$9.3 billion economic impact, employing approximately 80,000 people full-time as citrus grove workers, seasonal pickers, haulers, processors, packers and managers. The combined annual wage of citrus workers in Florida is \$2.7 billion, or about 1.5 percent of the state's wage income.



Florida citrus production in tons (lines) and dollar value (bars). Source: USDA-NASS (2008)

plan for addressing citrus greening disease. The committee was charged to examine the current citrus disease situation in Florida and the status of public and private efforts to address citrus greening, the capacity of the industry to mobilize a scientifically based response to disease threats and to translate scientific advances into products and services for the protection of Florida Citrus Industry in the short and long term.

Responses to Citrus Greening

The report's authoring committee found that at the present time, there are no effective means of curing a tree once it becomes infected with citrus greening. Treatments with heat or antibiotics are effective for shoot cuttings used in nursery stock but cannot eradicate the disease from whole trees. Vigorous pruning of symptomatic parts of the tree provides only short-term relief, and nutritional sprays have not demonstrated any real benefits in preventing the spread of citrus greening. The committee concluded that currently, the best approach for managing the disease is to:

- Remove infected trees to reduce the pool of bacteria
- Keep Asian citrus psyllid populations as low as possible
- Ensure that replacement trees are grown in insect-proof greenhouses, as has been required in Florida since January 2008

High-priority Recommendations

Although the committee is optimistic that advances in modern biology will enable the development of new methods to prevent or control citrus

greening disease in the future, there are several high-priority actions that could help sustain the Florida citrus industry until these new approaches have been developed. Those actions should be implemented simultaneously, and are focused on ways to improve the efficiency and effectiveness of current best management practices to limit the spread of the disease.

Create Citrus Health Management Areas

Establishing Citrus Health Management Areas would facilitate the coordinated control of psyllid populations, and the removal of trees infected with citrus greening. Citrus Health Management Areas will be regions of about 10,000 to 50,000 acres with similar levels of infection, which will mandate best management practices for the clean-up of abandoned orchards, the design and implementation of compensation plans, coordination of area-wide psyllid sprays, and removing infected urban citrus. The management areas should also include test plots to facilitate high-priority studies aimed at developing new strategies for managing the disease.

Integrate efforts to improve practices for insecticidal control of the psyllid

To date, the application of insecticides has been the most effective method of psyllid population control, but there are concerns that the widespread use of insecticides could result in several negative consequences. Repeated use of the same insecticides could lead to the emergence of a strain of insecticide-resistant psyllids, expose farm workers to potentially dangerous levels of chemicals, reduce populations of beneficial insects, and contaminate groundwater. The committee

CHMA Participants

- **Citrus Growers**

- Must be a grower driven program
 - No mandates
 - Voluntary participation
 - Growers motivate neighboring growers to participate
- Facilitated by local industry leader(s)
 - Organize local CHMA planning meetings
 - Work with other non-grower participants (IFAS, FDCAS, etc...)

CHMA Participants

- **UF-IFAS**

- Serve as an information resource for developing plans of action
 - Extension specialists (entomology, horticulture, pathology, etc...)
 - Extension county agents
- Provide infrastructure to facilitate grower communication of activities and results
 - Development of website for each CHMA
 - Email listserv notifications
 - County agent printed newsletters

CHMA Participants

- **FDACS - DPI**

- Support provided by personnel from the regional CHRP offices
 - GIS mapping of defined CHMA's
 - Routine psyllid monitoring of CHMA's

Steps in CHMA Establishment

- **Growers request assistance**
 - Contact should be made with CHMA coordinator (CRDF)
(Currently contact IFAS or CRDF until coordinator is functioning)
- **Planning meeting(s)**
 - Identify groves to participate in a CHMA
 - FDACS aids in providing mapping assistance
 - IFAS specialists assist in planning management program for upcoming season
 - Follow-up meetings as needed to finalize plan or to motivate more participation

CHMA Planning Meeting

Topics for discussion

- **Defining the CHMA Area**

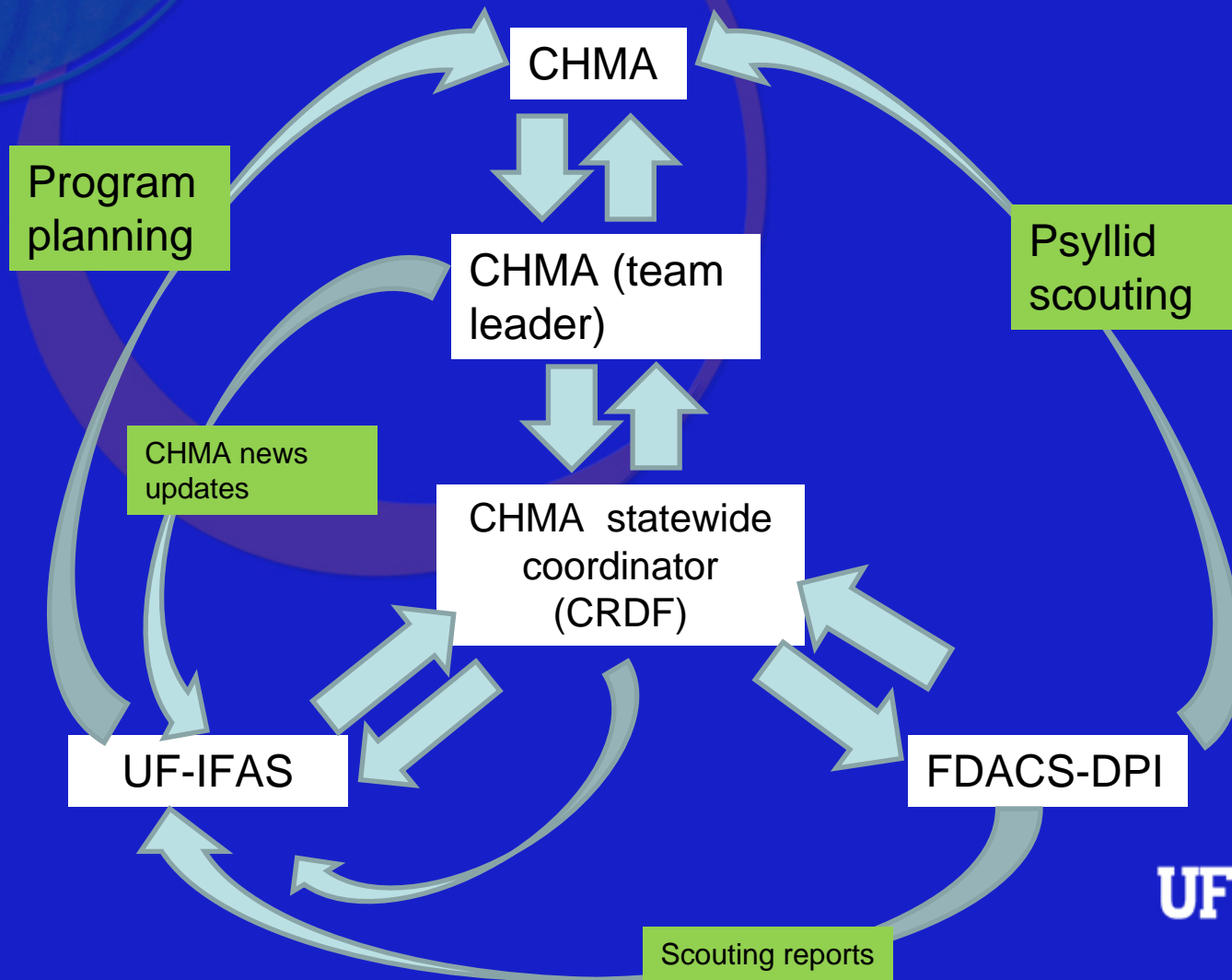
- Growers / Extension County Agents assist in delineating areas
- Based on presence and grouping of groves in region
 - Current infection rates and psyllid control practices
 - Current scouting practices / frequency
 - Tree removal practices
 - Abandoned groves
 - Organic groves
 - Export vs domestic markets (MRL's)

CHMA Meeting Goals

Topics for discussion

- **Developing a plan of action**
 - Timing and Frequency of applications
 - Pesticide rotation schedules
 - Application methods
 - Grower practices / limitations
 - MRL's for processed vs fresh fruit
 - Organic groves
 - Abandoned groves
 - Residential areas (dooryard trees)

How will CHMA's Function?



CHMA Meeting Materials

- **Maps delineating commercial citrus groves and abandoned areas**
- **Information on benefits of implementation, risks of non-action**
- **case studies in Brazil and Florida: managing HLB (psyllid) can work**
- **Meeting attendee list with contact information**

Tracking Progress / Measuring Success

- **Scout to determine before and after CHMA establishment**
 - % HLB infection
 - psyllid population dynamics
- **Define the acreage under CHMA**
- **Number of growers / groups participating**
- **Quarterly tracking / reporting (website)**
- **Identify hot spots and measures taken to reduce**

Proposed CRDF Role

- **CHMA Statewide Coordinator**
 - Liaison between CHMA team leader, UF-IFAS, FDACS-DPI and grower organizations
 - Assist CHMA team leaders with meetings and CHMA communications

Proposed UF-IFAS Role

- **IFAS Specialists**

- Aid in development of management plans based on latest research

- **IFAS county Agents**

- Provide assistance in planning within their regions

- **IFAS Extension Assistant**

- Maintain website communications for each CHMA
- Analyzes and updates psyllid scouting reports from FDACS-DPI maintained on IFAS-hosted website

Proposed FDACS-DPI Role

- **GIS mapping services**
 - Provide updated maps for each CHMA
- **Psyllid scouting**
 - Collect data on psyllid population to track success and identify trouble areas

Proposed Budget

- **CHMA statewide coordinator**
 - Salary \$80 – 100K
 - Vehicle for travel \$25,000
 - Fuel and miscellaneous \$12,000
- **IFAS Extension Assistant**
 - Salary \$60,525 (45K salary + 34.5% fringe)
 - Meeting materials / Miscellaneous \$12,000

Establishing CHMA's Final Thoughts

- **CHMA's will be important to:**
 - Implement practices that reflect the reality of dynamic local conditions
 - Preserve and optimize the limited current options for disease control
 - Facilitate the adoption of new solutions still in development