Florida Citrus Advanced Technology Program

QUARTERLY & FINAL REPORTS: Control of Citrus Greening, Canker & Emerging Diseases of Citrus

Instructions Complete the fields based on your project specs. When finished, save the form to your local disk using a unique name. Then, go to **http://research.fcprac.com**, and log in with your user name and password using Researcher Login in the lower left. Find this project title and click on **Submit a Report**. Update your profile information if needed, then upload this report as directed.

2009-2010 REPORT	CATEGORY (drop-down)	TODAY'S DATE (m/d/yr)
● *Quarterly Report* ○ *Annual Report* ○ *Final*	Psyllid	1/12/10

WHAT IS THE "HEADLINE" FOR THIS REPORT (e.g. a one-sentence "newspaper headline" describing what you accomplished)

An average of 25% infected psyllids collected from diseased trees in a grove successfully transmit HLB

TITLE and CONTACT INFORMATION

Proposal Title Asian citrus psyllid - Sampling, Biological Control, and Seasonal Profile of HLB in Adult Psyllids

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Phone 772-462-5897	*Project Duration (years)* 1 *Year of Project* 1
Organization USDA-ARS	*Total Direct Funds (current year)* $81,000

REPORT UPDATE (650 words; provide details about your headline)

Sampling - A stratified random sampling procedure was used to assess spatial dispersion of adult ACP according to yellow sticky trap sampling and stem tap sampling procedures, and optimum sample sizes and allocation were determined for both sampling procedures. Trap sampling and tap sampling indicated that adults were aggregated among trees, within individual strata and among strata across the block of trees studied. Regardless of whether trap sampling or stem-tap sampling is used, sampling should be conducted throughout a block because there can be significant variation across a block of trees in numbers of psyllids. Validation sampling indicated that, for commercially-acceptable precision levels at means of 1 or more adult psyllids per sample, 30 stem-tap samples or 28 sticky trap samples are required in a block of trees up to ten acres in size. Larger numbers of samples were required at lower densities.

Biological Control - (a) Release of three new biotypes of Tamarixia from Asia were initiated in Florida. It is too early to gauge establishment. (b) The insect pathogen Hirsutella citriformis may sometimes provide significant levels of adult psyllid mortality. Adult psyllid cadavers mycosed by this fungus were most common in a group of mature trees during the fall and winter from October through March. Near absence of cadavers mycosed by the fungus during May – June may be due to environmental conditions unfavorable to the fungus. In collaboration with the University of Florida, a method of culturing the fungus on media was developed. We are in the process of verifying pathogenicity of the culture. A study is planned to evaluate a number of citrus chemicals for toxicity to the fungus. (c) Releases of the parasitoid Diaphorencyrtus from south China. Over 9,000 wasps have been released in four counties in central and southwest Florida over the last three years (Collier, Hendry, Lake and Orange Co.). About 4,000 were released during 2009. Wasps were recovered in low numbers from commercial and research citrus groves in Immokalee during 2008, but no recoveries have been made during 2009. Studies are being continued on the biology of the parasitoid.

Seasonal HLB profile in adult psyllids – In this study, psyllids are collected fortnightly from diseased trees in a grove. Over all sample dates, an average of 91.7 (SEM 5.9) % of the trees tested HLB positive (mean CT 23.9, SEM 0.3) in the sample area. From Feb 2008 through Nov 2009, a mean of 33% (SEM 1.8) psyllids tested positive, with a minimum of 3% on one sample date and a maximum of 85% on another sample date. An average CT value of 25.2 (SEM 0.2) was recorded for infected psyllids over the entire study period. No definite trends in seasonality of HLB in adult psyllids have yet been identified over the course of this nearly two-year study with respect to percentages of psyllids infected or titers of the bacterium based on RT-PCR CT values. Beginning June 2008, once a month psyllids from the infected trees were caged individually on citrus seedlings for 7 days. After the 7 day period, the psyllids were tested for HLB and seedlings infested by an infected psyllid were assayed 6 months later for the pathogen. Over all study dates, an average of 57% psyllids tested HLB positive; an average of 25 (SEM 9.7) % infected psyllids transmitted the disease, with means per sample date as low as 0% and as high as 75%. It is too early to determine if there are any seasonal trends in transmission rates. The study was expanded during fall 2009 to include identifying the sex and body color of psyllids in the individual transmission experiments.