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	9/29/09

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

Citrus pesticides can be highly toxic to Tamarixia radiata, negating biological control of the Asian citrus psyllid

TITLE and CONTACT INFORMATION

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

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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. The intent of the research is to develop sampling guidelines for the purpose of making statistical comparisons among different groups of trees with respect to psyllid population levels. Both trap sampling and tap sampling indicated that adults were aggregated among trees within individual strata and among strata across the block of trees studied. There was little to no value in stratifying and, if the intent of sampling is to reduce between strata variation, less emphasis should be placed on the number of strata than on the number of trees to sample per stratum. 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. For commercially-acceptable precision levels, preliminary analyses indicated that at a mean density of one psyllid per sample, 30 stem-tap samples or 20 sticky trap samples may be required either per acre or per ten acres. We are in the process of validating these sample sizes.

Biological Control - (a) Research indicated that the following pesticides were least compatible with (most toxic to) adult T. radiata based on the toxicity of direct sprays and potential long residual life on leaves: carbaryl, chlorpyrifos, fenpropathrin, and phosmet. Each of the following may be somewhat more compatible because the toxicity of residues of these pesticides was either low at 24 hours or sharply decreased over a few days after application: abamectin, chenopodium oil, fenpyroximate, spirotetramat, sulfur, and 435 spray oil; depending on environmental conditions, imidacloprid and pyridaben might also be somewhat more compatible for the same reasons. The pesticides that consistently appeared to be most compatible with T. radiata were aluminum tris, copper hydroxide, diflubenzuron, fenpyroximate, and kaolin clay. More research is needed on kaolin clay, as rates higher than we tested might be more toxic and residues of this pesticide on leaves can negatively affect insect activity. (b) 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 conducted on the biology of the parasitoid.(c) PPQ granted permission to release three new biotypes of Tamarixia from Asia.

Seasonal HLB profile in adult psyllids – In this study, psyllids are collected fortnightly from disease trees in a grove. From Feb 2008 through August 2009, a mean of 41% psyllids tested positive, with a minimum of 3% on one sample date and a maximum of 85% on another sample date. In 2008, percentages of psyllids that tested positive during February – May ranged from 11 to 33% while a mean of 50% adults tested positive during June - August. A mean of 71% (maximum 85%) adults tested positive for HLB during September – December. Although during 2009 (through August) there were two sample dates on which only 10% of psyllids tested positive (February and March), in general there has been no definite trend in seasonality. Of interest will be if percentages of infected psyllids increase during the Sep - Dec period as they did in 2008. Seasonality of transmission rates is being investigated and will be reported next time.