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	2/20/10

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

Asian citrus psyllids move from unmanaged into managed groves, borders infested most, unmanaged groves source of HLB

TITLE and CONTACT INFORMATION

Proposal Title Quantitative measurement of the movement patterns and dispersal behavior of Asian citrus psyllid in Florida for improved management

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Organization University of Florida/IFAS	*Total Direct Funds (current year)* 101631

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

The movement patterns and dispersal capabilities of Asian citrus psyllid (ACP) required investigation to better understand the spread of huanglongbing (HLB) and to improve management strategies for ACP. Understanding movement patterns and dispersal behaviors of ACP will be essential in creating optimal pest control strategies with the hope of curbing the spread of HLB, and protecting citrus production in Florida. To investigate ACP movement, we adopted an immunomarking technique which utilizes crude food proteins (chicken egg albumin, bovine casein, and soy protein) to track the movement of ACP in Florida citrus. In brief, ACP are marked with proteins in the field and allowed to move naturally. They are re-captured on traps and analyzed for the marking protein. In this way, we can determine exactly: where psyllids came from, how far they moved, and how fast they moved. Initially we found that ACP movement is biased in the direction from abandoned or marginally managed groves into well managed groves. We also found that ACP are capable of moving back and forth between 2 groves separated by 100 yards within 2 days. Furthermore, ACP are capable of invading up to 100 yards into managed grove interiors within 4-7 days. Furthermore, during the spring, we found that ACP move even when there is abundant flush (food/egg laying sites) available. In terms of where psyllids tend to invade most often, we found that invading ACP are most often found within the first 3-4 rows of trees from the plot borders. More recently, we have been studying the seasonality of ACP movement. This research has been conducted by quantifying how many psyllids move on a monthly basis over the course of the entire year. The first year's results indicate that the majority of psyllid movement occurs during the spring and early summer months, while very little movement occurs September through February. We will need to repeat this experiment for another year to be certain that this pattern is consistent. There may be certain times of the year when frequent insecticide treatment is needed (particularly on plot borders) due to psyllid movement, but there may also be certain other times of the year when fewer treatments are necessary when ACP are not moving.

Given that we have proven that unmanaged and abandoned groves serve as a source of ACP infestation, our recent goal has been to determine the status of HLB infection in ACP and citrus trees in paired unmanaged and managed citrus groves separated by 100 yards or less. To accomplish this research, we sampled 7 pairs of adjacent unmanaged and managed groves. Surprisingly, we have documented slightly higher rates of HLB infection in both psyllids and trees in unmanaged groves than managed groves that were separated by 100 yards or less. These results confirm that abandoned and unmanaged groves not only serve as a source of psyllid infestation for adjacent managed groves, but also likely serve as a source of HLB infection. Effective HLB management in Florida citrus will therefore likely require removal of abandoned groves. Also, growers who are next to unmanaged citrus should consider protecting their border areas intensely to prevent immigration of infected psyllids into their groves. In summary, we have found that: 1) Movement of ACP occurs between unmanaged and managed groves; 2) The majority of ACP occur on the border rows of managed groves; 3) ACP adults can move at least 250 yards within 4 days; 4) Movement appears to vary over the course of the season – more movement in summer than fall/winter; 5) The HLB bacterium is present in ACP and trees in unmanaged and nearby managed groves; and 6) infection levels are 2.3 & 1.5 times greater in unmanaged groves compared with nearby managed groves. We have either completed or exceeded our goals for year 1 and look forward to repeating necessary experiments in year 2 and to collecting new data to complete the two year objectives. Some of this research has already been published in a peer reviewed journal (Environmental Entomology, 2009, 38: 1250-1258) and other portions are currently under review.