CITRUS ADVANCED TECHNOLOGY PROGRAM

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

SELECT PERIOD March 2014

(●) *Quarterly Report* ( ) *Final*

Proposal Title

Management Tactics Based on Psyllid Movement and Distribution in Florida Citrus

Today's Date	Sponsoring Organization (drop-down)	Category (drop down)
1/13/14	Citrus Research and Development Foundation	Vector Management

REPORT UPDATE (500 words-It is not necessary in this public report to disclose your institution's proprietary information or intellectual property.)

Issue date for this grant was 13 July 2012. Objectives are: 1. Assess effects of abiotic factors (light quality, photoperiod, air flow, temperature fluctuations) on psyllid movement, 2. Evaluate physiological limits and biotic factors effecting of ACP movement including feeding, egg load, infection status, and population density, 3. Evaluate techniques for tracking ACP movement in the field using mark recapture, 4. Characterize seasonal patterns of ACP distribution and movement at different scales in the field, 5. Develop strategies to protect young trees from colonization by ACP utilizing UV reflection for repellency and insecticide treated trap crops to attract and kill.

Objective 1. Movement up wind is typical although movement was suppressed by wind speeds above 2mph in wind tunnel assays. These observations were confirmed in the field. However, ACP movement rate in the wind tunnel was increased with the addition of a host plant upwind.

Objective 2. Dr. Stelinski's laboratory continued to investigate movement capability of ACP using laboratory flight mills. These devices allow direct measurement of ACP flight capability. They found that Candidatus liberibacter asiaticus (Clas) -infected psyllids perform long duration flights more frequently than uninfected counterparts. Infection was quantified with qPCR and estimates of CLas DNA titer per psyllid with emerging techniques that have been developed specifically for this project. Thus far, no correlation was found between amount of CLas DNA carried by an ACP and duration of flight. The hypothesis that flight capability is correlated with dispersal behavior is being tested by allowing psylldis to settle for 3 days on citrus plants, then introducing a new plant into the cage and collecting dispersing psyllids daily. Thereafter, dispersing psyllids are tested on the flight mill. Thus far, they have not found a significant correlation between flight capability on the mill and dispersal behavior. They have also found that green/blue morphs display long distance flights at a significantly greater frequency than brown/gray morph psyllids. Additionally, they are currently working on a protocol to measure the amount of protein, sugar and lipids within psyllids, with the objective of determining how these various energetic reserves contribute to flight/dispersal behavior.

Objective 3. ACP marked with fluorescent dye released in a semi-abandoned 'Murcott' block were found at night in nearby trees upwind although none were found on sticky cards outside the release point. Releases have not increased the extremely low levels of native ACP populations so additional mark recapture trials can be conducted at this location with minimal residual ACP population interference. ACP have also been observed in what appears to be feeding position on weeds within the grove. Further investigation is underway to evaluate use of non-host plant species by ACP.

Objective 4. Yellow sticky traps set at three canopy heights captured a total 1657 ACP; more in the upper canopy in the older Charleston grove but more evenly distributed within the canopy in the younger and more uniform Bob Paul grove. More ACP are captured on the east side compared to the west side of trees at both locations. ACP captures are greatest adjacent to a hammock or wind breaks at these and a third (English Grove) location. Traps set up at Bob Paul to assess ACP movement between insecticide sprayed and unsprayed blocks with low and high populations of ACP respectively indicate no significant directional differences over 136 captures to date.

Objective 5. A paper reporting positive results using UV reflective mulch to repel ACP the first 2 years after planting was published in the refereed journal Pest Management Science. Subsequent results indicate that the 5 ft strip of metalized mulch is not effective on trees more than 6 ft tall. Trials to determine the impact of reflective mulch on the height of ACP flight were resumed with warmer spring weather during which ACP movement generally increases.

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Form PR-12 Quarterly Reports **SUBMIT REPORT**

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