CITRUS ADVANCED TECHNOLOGY PROGRAM

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

▶ INSTRUCTIONS

(●) *Quarterly Report* ( ) *Annual Report* ( ) *Final*

Required: What is the "headline" for this report (e.g. a one-sentence "newspaper headline" describing what you accomplished)

Effects of plant nutrition on ACP host seeking behavior

Proposal Title

How does infection of Asian citrus psylid with Candidatus Liberibacter asiaticus affect the behavioral response of the vector to healthy versus diseased citrus trees?

Today's Date	Sponsoring Organization (drop-down)	Category (drop down)
1/27/12	Citrus Research and Development Foundation	Infection Consequences

REPORT UPDATE (500 words; summarize your accomplishments)

Our objective was to determine how psyllid host seeking behavior is affected by Las-infection. In previous experiments, we have determined that ACP adults initially prefer to settle on Las-infected plants than non-infected counterparts. This attraction to Las-infected plants appears to be dependent upon the plant's release of one specific volatile chemical that attracts psyllids. After settling on infected plants for a short period of time sufficient to acquire the Las pathogen, these potentially infected psyllids move from infected plants to healthy plants. Thus, the Las-pathogen is affecting the behavior of psyllids in way that promotes its own spread.

Based on published data, it is known that Las-infected plants have nutrient deficiencies. Therefore, we hypothesized that while the Las-infected plants are initially attractive to psyllids, after prolonged feeding the psyllids experience imbalanced nutrition and choose to seek a better host. To examine this hypothesis, we planned to determine how psyllids settle on plants with known nutrient deficiencies.

In the last quarter, we have worked towards creating nutrient deficient, yet uninfected plants. We have successfully achieved a low level of nutrient deficiency in some plants and conducted initial settling trials. In these trials, psyllids were initially caged on healthy citrus. Subsequently, the cage was removed and the psyllids were allowed to either stay on the healthy plant or move to a nutritionally deficient plant. In this experiment, an average of 69.5% of psyllids chose to remain on the healthy plants while on average 26.7% moved from healthy to nutrient deficient plants. In concurrent experiments, psyllids were initially caged on nutrient deficient plants and then allowed to move to healthy plants. In these experiments, an average of 72.4% of psyllids chose to move to the healthy plants, whereas an average of 24.7% of psyllids remained on the nutrient deficient plants.

We have continued to restrict application of fertilizer to these nutrient deficient plants in order to achieve further deficiencies. Samples of plant tissues have been sent for nutrient analysis, and upon receiving that data, another replication of these experiments will be conducted. In future experiments we will rescue these plants with each nutrient to determine which nutrients may be involved in affecting psyllid settling behavior. These data may be useful in predicting psyllid movement between citrus groves depending on nutritional status of trees. Also, this will help explain movement of pathogen by psyllids from tree to tree as a result of pathogen-altered psyllid host seeking behavior.

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SUBMIT REPORT

CITRUS RESEARCH AND DEVELOPMENT FOUNDATION, INC.