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)

Distribution of HLB in psyllids and citrus in field trials

Proposal Title

Spatial and temporal incidence of Ca. Liberibacter in Citrus and Psyllids detected using real-time PCR

Today's Date	Sponsoring Organization (drop-down)	Category (drop down)
1/10/11	Citrus Research and Development Foundation	Epidemiology and Cultural Control

REPORT UPDATE (500 words; summarize your accomplishments)

Spatial and Temporal Incidence of Ca. Liberibacter in Citrus and Psyllids Detected Using Real Time PCR, December 2010/January 2011. In July 2010, psyllid adults from our HLB negative colony on orange jasmine were caged on new shoots (10-12 adults/shoot/ per tree) that had been caged immediately after trimming and were not exposed to feral psyllid population. On the same tree an additional cage was placed on a previously uncaged shoot that was infested with feral psyllid nymphs. These adults and nymphs remained caged on the shoots for three weeks. Some adults from laboratory reproduced in the cages so when collected there were some nymphs available. Similarly cages with feral populations also had some nymphs and adults at the time of collection. Using PCR, 40 shoots tested HLB negative with average Ct value of 39.8 ± 0.07 and 15 shoots tested HLB positive with average Ct value of 27.4 ± 0.7. From lab reared adults caged on HLB negative shoots 69 were tested and all were negative. From their nymphal progeny 58 were tested and 1.7% were positive with Ct value 29.8. From the ones caged on HLB positive shoots 51 adults were tested and 12% were positive with average Ct value of 29.6 ± 0.7. Among 31 nymphs none were positive. Out of 88 adults that emerged from feral nymphs caged on HLB negative shoots 10% were positive with average Ct value of 28.9 ± 0.9. Only 5 nymphs were tested and all were negative. Among 53 adults that developed from feral nymphs caged on HLB positive shoots 9% were positive with average Ct value of 29.6 ± 0.9. No nymphs were tested.

We are also evaluating the effect of vector management on bacterial titer and fruit yield in the same 12-acre block of a commercial orange grove. The block was divided into 16 plots organized in a randomized block design with eight replicates and four treatments: (1) Nutritional (2) Insecticides (3) Insecticides + Nutritionals and (4) Untreated. Treatments (1) and (4) remained free of insecticides and the vector was allowed to thrive. In treatments (3) and (4), the psyllid population was monitored every 2 weeks and insecticide was sprayed when insect populations surpassed the nominal threshold of 0.5 psyllids per tap sample. To assess the titer values, we selected symptomatic branches on every fifth tree in every row for real-time PCR analysis every four months. Initially CT values and the percentage of PCR positive trees did not differ between treatments. In the last two years, CT values have dropped and most trees eventually tested positive. CT values from insecticide-treated trees became significantly higher in Jan 2010 (25.7 ± 0.6), indicating lower bacterial titers, compared with untreated plots (24.0 ± 0.1), although no difference between the two treatments in May 2010. Treated trees had significantly higher yields than the untreated trees. These results indicate that mitigation of vector pressure with insecticide decreased alleviated bacterial titer over time and positively affected yield despite the same incidence of HLB. In August 2009, Ct values of psyllids from insecticide treated and untreated trees averaged 38.4±0.9 (0% positive) and 37.5 ±0.5 (2.4% positive) for adults, 37.8±0.5 (0% positive) and 37.9±0.7 (1.1% positive) for large nymphs and 39.1±0.3 (0%) and 37.6±0.9 (2.5% positive) for small nymphs.

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Organization University of Florida-SWFREC

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SUBMIT REPORT

CITRUS RESEARCH AND DEVELOPMENT FOUNDATION, INC.