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)

Evaluation of foliar zinc/manganese for management of HLB

Proposal Title

Evaluation of foliar Zinc and Manganese application for control of Huanglongbing or associated symptom development

Today's Date	Sponsoring Organization (drop-down)	Category (drop down)
5/16/12	Citrus Research and Development Foundation	Epidemiology and Cultural Control

REPORT UPDATE (500 words; summarize your accomplishments)

Objective 1 is to conduct a field evaluation of nutritional sprays for control of HLB and HLB symptom expression and yield. The field study was set up May 2010 in Southern Grove, Hendry Co., FL. Six treatments were located in 4 plots of 150 trees per treatment (interior 10 trees in each block were identified for PCR, leaf nutrition sampling, tree health and yield evaluation). Treatments were 1) non-treated check; 2) Nutri-Phite sprayed 4 times bimonthly; 3) N-Sure sprayed bimonthly; 4) Agra Sol Mn/Zn/Fe plus Nutri-Phite plus triazone urea sprayed bimonthly; 5) Keyplex 1400 DP plus Nutriphite plus triazone urea sprayed bimonthly; 6) Wettable powder nutrients (Diamond R #2) plus Nutri-Phite P+K sprayed bimonthly. The materials were applied to both sides of the tree in 125 gallons per acre with an airblast sprayer driven at 2 mph to obtain thorough coverage. Three disease ratings have been taken so far and a slight decline in tree health has been observed, but no significant treatment effects have been observed. There were no significant treatment differences in yield at the first harvest, after the initiation of treatments the previous April.

Objective 2 is to determine the mechanism of HLB symptom suppression by foliar nutritional application, Rep 1 from a prior 1 year grant using Hamlin sweet orange trees inoculated with HLB and treated bimonthly with the nutritional sprays treatments 1, 2, 3, and 5 from objective 1 has finished. Monthly monitoring of Infection rate and disease development did not show obvious treatment differences except a possible increased rate of decline in treatment 2 compared to all other treatments. Trees that were only PCR+ in root tissue showed an unexpectedly fast decline across treatments. After pruning trees at 6 MPI for canopy management, sampling at 7 MPI showed a slight reduction in titer in the new flush of all treatments except treatment 1, where no Las was detected until 8 MPI. This suggests that treatments 2,3, and 5 may potentiate movement of Las to new flush where psyllids are most likely to feed and acquire Las. Sectioned midrib samples were observed by light microscopy at 6 and 8 MPI and 9 MPI. At 6 MPI reduced phloem plugging and necrosis was observed in treatments 3 and 5, however these treatments had some symptomatic leaves without detectable Las. These leaves had abnormal starch buildup preferentially in phloem tissue instead of mesophyll cells. At 9 MPI there was significant variation in plugging between midribs within a treatment even with highly similar symptoms and Las titer. All treatments had a full range of phloem damage observable in midribs from similarly symptomatic leaves ranging from severe plugging and collapse to apparently healthy phloem.
Rep 2 plants began bimonthly nutritional treatments in June and were inoculated at the end of August and monthly samplings of leaf and root tissue are underway. Root samples are split for qPCR Las quantification and starch analysis for a quantitive measure of phloem function throughout the plant. Month 1 post inoculation samples have just been harvested and are being processed for qPCR.

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Total Funds (current year) $59,609.00

SUBMIT REPORT

CITRUS RESEARCH AND DEVELOPMENT FOUNDATION, INC.