CITRUS ADVANCED TECHNOLOGY PROGRAM

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

SELECT PERIOD June 2016

Quarterly Report ● Final

Proposal Title

Citrus preharvest drop related to HLB disease – Nature and control

Today's Date	Sponsoring Organization (drop-down)	Category (drop down)
9/13/16	Citrus Research and Development Foundation	Epidemiology and Cultural Control

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

Low concentrations (1/4 rate) of 2, 4-D and Max-Cel were applied every 45 days to Hamlin and Valencia tree canopies at two locations in central Florida starting in Spring 2014. Concentrations were 12.6 ml Citrus Fix and 480 ml Max-Cel/acre. Every other 45 day period, GA3 (0.04 g ai/tree) was applied in 3 gal of water per each microjet irrigation zone. Treatments were applied from Spring through October. Trees were sampled in late spring for phloem development at four locations in the scaffold system (root flare, trunk, small scoffolds and leaf main veins). Trees were again sampled in late fall for phloem development at the same four locations in the scaffold system. Comprehensive PCR profiles on the treatments were run by Dr. Killiny and blight analyses were run in Albrigo's lab. Almost all of the treatment trees were positive for HLB and about half were positive for citrus blight.

Fruit drop and fruit per tree data were collected for Hamlin plots and similar Valencia data was collected also in year one. In the Hamlin test 2, 4-D + Cytokinin with or without GA had less fruit drop than the Control trees, 11.5 and 13.1, respectively, versus 17 % drop for the Control, significant at the 1 % level. The Valencia trial had drop rates of 8.0 and 9.8 % for 2, 4-D + Cytokinin with and without GA compared to 10.5 % drop for the Control with no significant differences. No differences in leaf drop were detected.

In year two, root densities and spring flush/leaf counts and 2015-16 crop fruit counts were collected using 8 limb counts per 2 tree conditions per plot. Root densities averaged about 10 gm fresh weight per tree with no difference between treatments. Total leaf drop per tree averaged 249 leaves for the Control trees and the treated trees had 3 % more dropped leaves for the MaxCel + 2, 4-D and the GA treatments and the combined treatment of all three PGRs had 4 % less leaf loss. Percentage fruit drop was equal to the Control (22.5 %) or higher by one or four %.

The low concentrations (1/4 rate) of PGRs every 45 days to Valencia orange trees in the 2015-16 growing season did not reduce fall leaf drop nor preharvest fruit drop of HLB infected trees in the second year. Total leaf drop per tree averaged 400 leaves for the Control trees and the treated trees had 7 to 17 % more for the 3 treatments (MaxCel + 2, 4-D, GA treatments and combined). Most of the difference was in the accumulated summer leaf drop, August count. A similar result occurred with the Hamlin trial. No difference in phloem development was detected.

Percentage fruit drop was near 15 % for the Control and all the treatments. The fruit per tree in the second year of treatments was plus or minus 4 % of the Control for all the treatments and not significant. Further no improvement in tree condition occurred so the experiment was terminated.

Two greenhouse experiments were conducted to see if GA soil applications improved root growth. GA rates were 0, .00125, .0025, .005, and .0063 g ai/plant. The number of new roots was increased 38 and 31% over the Control by the two higher GA concentrations after 3 weeks. Total and average root length increased by 27 and 28%, respectively, 6 weeks after application. The test was rerun on HLB affected nursery trees. Some increase in root growth occurred, for the bottom third of the pots averaged root length was 25 and 35 cm at 4 and 8 weeks for the highest GA level (.1 gm) while the controls averaged 14 and 20 cm. For the middle of the pot the best growth was for the lowest GA concentration (0.00125) but only at 8 weeks, 18/27 versus 23/23 for the control. Little difference was found in the top third of the pot. GA did not cause as much response in HLB affected trees and tree to tree variability was much greater.

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Form PR-12 Quarterly Reports SUBMIT REPORT

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