CITRUS ADVANCED TECHNOLOGY PROGRAM

QUARTERLY & FINAL PROGRESS REPORT FORM: Control of Citrus Greening, Canker & Emerging Diseases of Citrus

▶PROJECT QUARTER END April 2023 ◯ *Quarterly Report* ◉ *Final*

Proposal Title

EDetermining new cost-benefit guided Phytophthora propagule treatment thresholds for HLB-affected citrus

Today's Date 08/26/2024

Sponsoring Organization (drop-down) Citrus Research and Development Foundation

Category (drop down) Other

ABSTRACT (Executive Summary-public report-do not disclose proprietary information or intellectual property)

1. Please state project objectives and what work was done to address them:

Objective 1. Determine if labelled Phytophthora management maintains efficacy in the field on HLB-affected trees for reducing fibrous root loss and improving yield.

Objective 2. Determine benefit-cost thresholds for Phytophthora treatment on HLB-affected trees.

We evaluated 6 or 7 phytophthora programs (depending on site) in mature, HLB-affected trees located in either southwest Florida (SWF) or south central Florida (SCF). We looked at Hamlin, Valencia, and a mix of Early varieties among the four experiment locations. The programs were were 1) untreated control, 2) three applications potassium phosphite (4.7 liters/ha; ProPhyt, 54% a.i.), 3) oxathiapiprolin (0.7 liters/ha; Orondis, 18.4% a.i.), 4) mefenoxam (0.6 liters/ha; Ridomil Gold, 45.3% a.i.), 5) fluopicolide (0.3 liters/ha; Presidio, 39.5% a.i.), 6) program of mefenoxam, fluopicolide, phosphite, and oxathiapiprolin in that order (same rates as above, referred to as the combination treatment), and 7) oxathiapiproline and mandipropamid (0.6 liters/ha; Orondis Ultra, 2.77 and 23.1%a.i.). Treatment 7 was only applied in the SCF location. The applications were made in April, early June, July, and September to be timed with the root flushes. All treatments were soil applied through irrigation except for the foliar phosphite applications, which were applied via handgun. In each location, root density, phytophthora propagule count, yield, and fruit quality measurements were collected. There was no significant treatment ($P > 0.05$) effect on root density or phytophthora propagule counts in the SWF Valencia or the SCF Early oranges or Valencia. There were significant improvements ($P < 0.05$) in root density and propagule counts compared to the control in the SWF Hamlin. Unfortunately, this did not translate to improved yield in any year. There were no yield improvements or differences among the treatments in the other site either. Furthermore, all the sites were affected by Hurricane Ian and the trees struggled to recover from the damage. There were no significant differences ($P > 0.05$) for Brix, Brix/acid, acid, juice content, or juice color. The exception was the juice content from the fruit of SWF Hamlin, where the untreated control had significantly more juice ($P < 0.05$) than the foliar phosphite applications and the four-product treatment program. These results did not correlate with the yield responses. There were no significant differences in fruit volume from the SWF sites, but the SCF sites both had significant differences ($P < 0.05$). However, the trends were not consistent between the Early oranges and Valencia and did not correlate with the yield results. Based on the results in this study, no consistent measurable effect of treating mature HLB-affected citrus trees could be discerned. This may be because Hurricane Ian damaged the trees and masked any positive outcomes after year 2 in SWF and less than one year in SCF.

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Organization CREC/UF

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Project Duration (years) 3 *Year of Project* 3

% Completion of Objectives (FDACS requirement) 100.00%