CITRUS ADVANCED TECHNOLOGY PROGRAM

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

PROJECT QUARTER END June 2021 ● *Quarterly Report* ○ *Final*

Proposal Title

Foliar phosphate fertilization: a simple, inexpensive, and unregulated approach to control HLB.

Today's Date	Sponsoring Organization (drop-down)	Category (drop down)
07/10/2021	Citrus Research and Development Foundation	Horticultural & Management

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

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

Our field trials to test foliar fertilization with potassium phosphate to alleviate HLB symptoms and increase yield of citrus continue with the most recent fertilization done a month ago. More sampling is being done within a couple of weeks.
Foliar phosphate fertilization field trial (Hamilton and Immokalee)
phosphate have been applied every three months since July 2019 (Hamilton) and September 2019 (Immokalee). We have currently extracted DNA and analyzed CLas copy number through TerC and 16S qPCR. The copy number of CLas declined in the 2mM phosphate treatment group after a year of spraying but that decline has now leveled off. We are currently collecting data on the leaf area index of the tree to determine if leaf density has improved with the spring flush. Fruit yield data will also be available soon.
Foliar phosphate fertilization on CLas negative Valencia trees (Greenhouse)
Our greenhouse experiment continues to test whether foliar application of soluble potassium phosphate can reduce citrate level in the phloem of citrus trees. Treatments consist of foliar application of 6mM and 2mM potassium phosphate and/or 6mM insoluble calcium phosphate applied to the medium. Each treatment has six replicate trees and control trees are treated with 6mM potassium sulfate to standardize potassium application. All treatments receive a base fertilization with all macro and micro nutrients without phosphate. Every three months three leaves are collected from each tree, midribs are excised and sent off to Dr. Killiny's laboratory in UF CREC for quantification of citrate and phosphorus levels. Citrate levels have declined significantly in the foliar fertilized plants but it is not yet clear whether that decline will be significant enough to stop CLas infection.
Foliar phosphate fertilization on graft-infected Valencia (Greenhouse)
The greenhouse experiment hosted by Nabil Killiny's group continues to show measurable differences of CLas titer between treatments. These trees are given a potassium phosphate foliar spray, a calcium phosphate soil drench (to mimic FL grove soils), or no added phosphate other than what is in the typical fertilizer mix. We continue to visually observe the disappearance of HLB symptomology in the treated saplings. Titer has declined but wew need more sampling to determine if these is sustainable over a longer period. In the lab, qPCR continued from leaf samples to assess HLB titer in both greenhouse and field plants. Organic acid measurements were made in each experiment above. K-phosphate treatments reduced phloem citrate levels by 50%.

2. Please state what work is anticipated for next quarter:
Field trials continue. A mnuascript is being written now on our resultes to date. Yield and canopy measures expected next quarter. q PCR analysis on first 24 months of samples will be done and analyzed.

3. Please state budget status (underspend or overspend, and why): Spending at the expected rate now.

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Organization UF

Sponsor Project Number 18-024

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

% Completion of Objectives (FDACS requirement) 88.00%

CITRUS RESEARCH AND DEVELOPMENT FOUNDATION, INC.