CITRUS ADVANCED TECHNOLOGY PROGRAM

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

▶PROJECT QUARTER END December 2023 ● *Quarterly Report* ○ *Final*

Proposal Title

Determine optimal timing for application of fertilizer to improve fruit quality and reduce preharvest drop

Today's Date	Sponsoring Organization (drop-down)	Category (drop down)
02/07/2024	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:

The overall goal of the project is to develop fertilization strategies to best match nutrient supply and demand, and develop recommendations for optimal nutrient application timing as compared to a simple constant supply, which will improve fruit yield, quality, and reduce fruit drop.

A)

Objective 1) ***Test if a reduced N-P-K nutrient supply in the fall is safe for sustaining HLB-affected citrus, and whether it can improve fruit quality to facilitate earlier maturity / harvesting and reduce fruit drop*:**

Trunk diameter, fruit growth, fruit drop measurement was done in Hamlin and Valencia during October to December. Additionally, routine leaf sampling was accomplished during October and December for leaf nutrient analysis. In the 2nd week of November, treatment-wise fruit was harvested from the Hamlin variety for yield data, fruit drop % calculation, and fruit quality measurement. Temporal treatment responses on different variables and results recorded during October to December were presented and interpreted below.

1. Trunk Growth: There were no significant treatment differences on relative growth rate of trunk diameter (mm/cm/month) in both Hamlin and Valencia varieties during October to December 2023. However, overall trunk growth rate in approximately in two years of the experiment was significantly higher in Valencia variety in treatment T8 and T9 (fertilizer applied 125% RDF (recommended dose of fertilizers) with 100% in spring and 25% fall season).

2. Fruit relative growth rate (RGR): Fruit diameter of tagged fruit was measured every two weeks to calculate the relative growth rate of fruit after physiological fruit drop in May in both varieties. In both years, fruit RGR was not significant after August in Hamlin and Valencia. Overall fruit RGR (mm/cm/month) was also statistically non-significant between treatments in both varieties in both years.

3. Fruit drop: Fruit drop was extremely high, and started after physiological fruit drop in May. We counted dropped fruit every two-week intervals in both varieties. Treatment 6 (50% fertilization in August), Treatment 8 (125% fertilization in spring and 25% in August) and Treatment 2 (linear fertilization with 25% in August) resulted in a higher numbers of cumulative number of fruit drop per tree in Hamlin in 2023. However, only Treatment 2 showed higher fruit drop in Valencia. Fruit drop percentage was calculated based on number of fruit harvested and number of fruit drops before fruit harvesting. In 2023, only 3 replications were used for calculation in Hamlin because the 4th replication was heavily affected by citrus canker in addition to HLB disease. The fruit drop rate was higher than 70% in all fertilization treatments which were not statistically significant between treatments in Hamlin variety.

4. **Fruit quality at harvest:**

a. Fruit size (diameter and weight): After harvesting, 10 fruits were selected to measure the fruit diameter

PI First Name Arnold

PI Last Name Schumann

Email schumaw@ufl.edu

Phone 863-956-1151

Organization CREC

Sponsor Project Number 21-024

Project Duration (years) 3 *Year of Project* 2

% Completion of Objectives (FDACS requirement) 70.00%

CITRUS RESEARCH AND DEVELOPMENT FOUNDATION, INC.