CITRUS ADVANCED TECHNOLOGY PROGRAM

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

▶PROJECT QUARTER END March 2025 ● *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)
04/24/2025	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*:**

In the first quarter of January to March, fruit drop was counted regularly in Valencia with 15-day intervals until harvesting. Final fruit harvesting was accomplished for yield, fruit drop %, and fruit quality measurement in mid-January. This was earlier than expected, but necessary due to the risk of additional excessive fruit drop, but the fruit was meeting juice quality standards. Similarly, leaf sampling and soil sampling were done after fruit harvesting for further leaf nutrient and soil chemical analysis, which was sent to Waters Agricultural Laboratories. Fruit dropped and yield data were presented here.

Fruit drop rate and cumulative fruit drop:
The nutrient management treatments were statistically non-significant in affecting the fruit drop rate. Treatments that were linearly fertilized with late fall application (T2), extra fertilization (T9 and T10) trended in a higher (but NS) fruit drop rate compared to sigmoidal fertilization with 25% split twice in fall (T5). In Valencia, the cumulative fruit drop per tree was significantly higher when the sigmodal treatment was supplied with 50% extra fertilization. However, T4 treatment (100% sigmoidal supply with 25% in fall (Sept)) resulted in significantly low cumulative fruit drops (54 fruits/tree).

Fruit yield and juice quality:
In Valencia, fruit yield was estimated after early harvesting during the middle of January due to excessive fruit drop. Nutrient management treatments did not significantly influence fruit yield in 2024, while the highest yield was in sigmoidal treatment T7 (4477 kg/ha; 44 boxes/acre) and T6 (4239 kg/ha). The overall fruit yield was extremely low even with extra fertilizer application and other management practices, which illustrated that HLB infestation causes a severe impact on tree health and reduces the nutrient management response. Similarly, there were no statistical differences in titratable acidity (TA) and maturity index (MI) juice quality with respect to nutrient management treatment. Interestingly T2 (linear supply with late fall application) resulted in significantly higher total soluble solids (TSS) (8.73 brix) compared to sigmoidal fertilization with 25% extra supply in spring (T8 and T9).

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Organization CREC
Sponsor Project Number 21-024
Project Duration (years) 3 *Year of Project* 3.5
% Completion of Objectives (FDACS requirement) 95.00%

CITRUS RESEARCH AND DEVELOPMENT FOUNDATION, INC.