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

CTV-T36 vector as a tool to induce efficient flowering in citrus seedlings

Today's Date: 04/24/2025

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 this quarter to address them:

Induce efficient flowering in citrus seedlings by overexpressing FT3 and knocking out negative regulators of flowering.

1- As FT3 expression undergoes rapid recombination in citrus, during the last quarter, we inoculated additional plants and successfully infected sweet orange seedlings directly with virion preps for CTV vectors expressing FT3 as confirmed by ELISA. These same virions were also inoculated into *C. macrophylla*. In *C. macrophylla*, the CTV vectors expressing FT3 induced flowering, whereas in sweet orange seedlings they failed to induce flowering. We continue to monitor them for flowering.

2- We attempted additional graft budding of *C. macrophylla* plants infected with CTV vectors manipulating negative and positive regulators of flowering via different strategies. Most grafts failed. However, among the few grafts that established, flowering was induced by the CTV vectors manipulating the same set of genes via different sequences. Thus, we are slowly but surely identifying the set of genes that would induce more efficient flowering when combined with the FT3 transgenic Carrizo in non-transgenic grafted citrus scions.

3-We repeated ELISA on the plants inoculated by the CTV vectors expressing FT3 from *Arabidopsis*,*C. sinensis* and *C. clementia* in combination with a silencing suppressor. However, these plants are still negative by ELISA.

4-We wanted to perform next generation sequencing on different CTV vectors manipulating the suppression of negative regulators of flowering and induction of positive regulators of flowering. However, the tissue available to do the work was not optimal which forced us to wait for late spring flush to emerge.

2.Work projected for next quarter:

PI First Name Choaa

PI Last Name El Mohtar

Email mohtarc@ufl.edu

Phone 863-956-8714

Organization: University of FLorida

Sponsor Project Number: 21-014

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

% Completion of Objectives (FDACS requirement): 75.00%

CITRUS RESEARCH AND DEVELOPMENT FOUNDATION, INC.