CITRUS ADVANCED TECHNOLOGY PROGRAM

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

▶PROJECT QUARTER END June 2024 ● *Quarterly Report* ○ *Final*

Proposal Title

Developing near and long-term management strategies for Lebbeck mealybug (Nipaecoccus viridis) in Florida Citrus

Today's Date	Sponsoring Organization (drop-down)	Category (drop down)
07/14/2024	Citrus Research and Development Foundation	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:

Develop monitoring tools to time management actions

We have previously reported that captures of *N. viridis* in cardboard band traps are increased in areas of citrus trees that are mechanically injured as compared with similar but uninjured citrus branches. We subsequently identified volatiles (γ-terpinene, citronellal, citronellyl acetate, β-*E*-farnesene, α-humulene, and α-*E*-*E*-farnesene) that are upregulated in response to damage and confirmed attraction of *N. viridis* to these volatiles associated with mechanical damage of citrus. Recently, we documented increased captures of various life stages of *N. viridis* in cardboard band traps baited with a 10 µg/µL concentration of farnesene: ocimene: sabinene blend (in 7:13:17 ratio), as well as those releasing either farnesene or ocimene alone at this same concentration, as compared with the mineral oil (diluent) negative control. These volatiles could be useful for development of an effective monitoring trap for *N. viridis*, or other control tools. Our current goal is to optimize dosage and blend ratio of volatile components to further increase mealybug captures.

We have been attempting to evaluate traps baited with the farnesene: ocimene: sabinene 3-component blend as well as farnesene or ocimene alone at a series of loading concentrations ranging between the 10 µg/µL shown to be attractive previously as compared with higher concentrations of 100 and 1,000 µg/µL. Our hypothesis is that increasing the loading concentrations of volatiles used bait traps will increase captures of mealybugs on traps in the field. Our objective is to conduct the experiments under authentic field conditions because we have already determined which volatiles are involved in attracting the mealybug under laboratory conditions and the investigation has moved toward development of practical tools in the field. The experiment employs cardboard band traps (CCBTs) that are deployed around three branches and trunks of each replicate infested citrus tree. A designated volatile treatment is enclosed in a release capsule, which is then attached to each CCBT. Mealybug captures on traps are recorded over time to determine if volatile treatments affect captures of mealybugs as compared with unbaited controls. Unfortunately, during our previous two attempts in the last quarter to conduct the experiment under field conditions, we were unable to collect reliable mealybug catch data because plots were overprayed with insecticides for management purposes. These management sprays crashed mealybug populations and prevented us from collecting reliable data. Although we will continue attempting to conduct the experiment at this same location, where mealybug populations have been historically high, we have also identified a new site as a backup that is infested with *N. viridis* mealybugs and that will not be receiving sprays. Therefore, we are confident that we will be able to conduct the above-described experiment and finish this investigation in the next quarter by evaluating higher loading concentrations of our volatile baits.

Describe the feeding interactions of lebbeck mealybug with citrus trees

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Organization CREC

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Project Duration (years) 1 *Year of Project* 1

% Completion of Objectives (FDACS requirement) 50.00%

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