CITRUS ADVANCED TECHNOLOGY PROGRAM

QUARTERLY & FINAL REPORTS: Control of Citrus Greening, Canker & Emerging Diseases of Citrus

SELECT PERIOD June 2012

(●) *Quarterly Report* ( ) *Final*

Proposal Title

Rapid and Efficient Delivery of Effective Compounds into Citrus Phloem for Treatment of HLB Bacteria

Today's Date	Sponsoring Organization (drop-down)	Category (drop down)
7/10/14	Citrus Research and Development Foundation	Epidemiology and Cultural Control

REPORT UPDATE (500 words-It is not necessary in this public report to disclose your institution's proprietary information or intellectual property.)

This is the second year of a 3-year project. The overall goal is to efficiently deliver antimicrobial molecules into citrus phloem against HLB bacteria. This quarter's (From April to July 2014) research continued to evaluate the effect of novel nano-emulsions against HLB bacteria, and optimize nano-emulsions by particle size analysis and evaluation of thermal stability.

HLB-affected potted citrus trees treated with W/O and O/W nano-emulsion containing several antimicrobials by foliar spray and basal bark application respectively, were free of HLB bacteria by PCR and recovered from any disease symptoms, after 8 months and 4 months from initial treatment in 2013.

Based on pesdo-ternary diagram phase in our pervious study, several O/W and W/O nano-emulsion were selected for optimizing the formulation by analyzing the particle size and evaluating the thermal stability. The particle size of five O/W nano-emulsion formulations ranged from 3.81 nm to 30.30 nm and the formulations were stable at temperatures from -20 ° C to 45 °C. And the particle sizes of 16 W/O nano-emulsions formulations ranged from 2.95 nm to 35.3 nm and they were also stable at temperatures from -20 °C to 45 °C. Thus, we have developed stable formulations that will effectively deliver antimicrobials to citrus and control HLB under greenhouse conditions.

The future work will be focus on: 1) Evaluation of compound loading using the optimized nano-emulsion formulations; 2) Evaluation of effect of the combination of optimized nano-emulsion and ideal penetrants on controlling HLB disease in the field by foliar spray and basal bark application.

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Organization IRREC-IFAS, University of Florida

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