CITRUS ADVANCED TECHNOLOGY PROGRAM

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

SELECT PERIOD December 2015

(●) *Quarterly Report* ( ) *Final*

Proposal Title

Insecticide resistance monitoring and management in Florida citrus to maintain sustainable control of Asian citrus psyllid within Citrus Health Management Areas (CHMAs)

Today's Date	Sponsoring Organization (drop-down)	Category (drop down)
1/26/16	Citrus Research and Development Foundation	Vector Management

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

The goals of this project are to:

1. Continue monitoring ACP field populations for insecticide susceptibility in Florida.
2. Develop a useful tool to improve monitoring for resistance and to make such monitoring quick and easy.
3. Refine and implement effective rotation schedules based on understanding what is taking place in the field and our understanding of the fundamental resistance mechanisms in ACP.

We are looking for development of an inexpensive, standardized diagnostic method to monitor insecticide resistance for all citrus grower against Asian citrus psyllid (ACP), Diaphorina citri, in Florida. This experiment used susceptible laboratory population of ACP was reared in a greenhouse at University of Florida, the Citrus Research and Education Center, Lake Alfred, FL. Tested insecticides were analytical grade and included bifenthrin (98%), dimethoate (99.5%), fenpropathrin (99.1%), imidacloprid (99.9%), cyantraniliprole (98.%), sulfoxaflor (99.5%), flupyradifurone (99.5%) and spinetoram (76.2% J-21.0% L) representing several insecticide classes. According to the manufacture recommendation, the insecticides were stored in freezer, room temperature and a cool dry place, respectively. About 0.01 or 0.1g of each chemical was weight and mixed with acetone (assay 99.5%). Various concentrations of the chemicals were prepared using the serial dilution procedure. Dilutions of technical insecticide in acetone were made to generate test concentrations ranging from 0.0001 to 10000 ng/µl. The bottle bioassay method was used to evaluate direct toxicity of insecticides against ACP adults to determine the LC50 and time to 100% knockdown rate. Each experiment was repeated three times and replicated five times. Toxicity of ACP was assessed 24 hours after treatment. Time to 100% knockdown rate was observed after 15, 30, 45, 60, 75, 90, 105 and 120 min. Results showed LC50 values of test insecticides ranged from 0.05 to 0.84 ng/µl. The 100% knockdown rate within the 1 hour period time was between 1000 to 10000 ng/µl with the exception of sulfoxaflor, cyantraniliprole and spinetoram. This study showed that a bottle bioassay is suitable for assaying insecticide resistance against adult ACP in the laboratory and should be useful to monitor insecticide resistance in the field. It should be a feasible and flexible tool for rapid testing of insecticide resistance.

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Organization UF-IFAS

Project Number 15-038c

Project Duration (years) 1 *Year of Project* 2

Total Funds (current year) $60,428.00

Form PR-12 Quarterly Reports **SUBMIT REPORT**

CITRUS RESEARCH AND DEVELOPMENT FOUNDATION, INC.