CITRUS ADVANCED TECHNOLOGY PROGRAM

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

▶ INSTRUCTIONS

(●) *Quarterly Report* ( ) *Annual Report* ( ) *Final*

Required: What is the "headline" for this report (e.g. a one-sentence "newspaper headline" describing what you accomplished)

Relative susceptibility of Corymbia and Pongamia to Diaprepes

Proposal Title

Application of an aggregation pheromone for management of the Diaprepes root weevil

Today's Date	Sponsoring Organization (drop-down)	Category (drop down)
9/25/14	Citrus Research and Development Foundation	Vector Management

REPORT UPDATE (500 words; summarize your accomplishments)

After discovery, identification and successful synthesis of methyl (Ɛ)-3-(2-hydroxyethyl)-4 methyl-2-pentanoate, laboratory behavioral assays confirmed it as a male-produced aggregation pheromone in Diaprepes abbreviatus. Colony-reared DRW used in choice assays confirmed that females are attracted to synthetic pheromone when given a choice between pheromone and clean air. Because the pheromone is developed in the male hind gut and released from frass, validation of the presence and attraction of the pheromone in the frass was tested with frass from locally collected wild-type males in the same type of choice assay using wild-type females. Wild-type females preffered male frass over humidified air. Identification of specific plant volatiles (kairomones) that serve as attractants to DRW and the ability to produce the synthetic pheromone led to a small field trial that attempted to attract DRW to traps baited with log doses of synthetic pheromonne. The baited rubber stoppers failed to attract any DRW. Further validation of the naturally produced male pheromone and kariomones (carvacrol and linalool) in laboratory behavioral assay trials took precedence throughout the remainder of 2013 and much of 2014. Early evidence of colony-reared female attraction to one batch of carvacrol (CAS# 499-75-2) at rates of 0.1µL – 1.0µL elicited interest as a possible attractant. An assay conducted at that time that used 50µL of carvacrol obtained from a newly purchased bottle (also CAS# 499-75-2) deterred DRW in the olfactometer: 83% chose humidified air. Choice trials conducted in 2013 and 2014 focused on locally collected wild-type male and female DRW—starved for 24 hours with each sex separated from the other for the duration of the starvation period—response to previously untested component blends to develop a better understanding of the relationship of the male-produced aggregation pheromone and other naturally produced stimuli. All assays were conducted using frass collected from the colony cage housing either females only or males only. Assays conducted to date that produced response choices with a significant difference (G-test with Yates Correction, α=0.05): 85% of females chose male frass vs. air; 75% of females chose air vs. male frass + "new" carvacrol + linalool; 80 and 90% of males and females, respectively, chose male frass vs. male frass + "new" carvacrol + linalool. In these tests, carvacrol was clearly a repellent to both sexes of DRW.

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Organization USDA-ARS

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

Total Funds (current year) $29,500.00

SUBMIT REPORT

CITRUS RESEARCH AND DEVELOPMENT FOUNDATION, INC.