Florida Citrus Advanced Technology Program

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

Instructions Complete the fields based on your project specs. When finished, save the form to your local disk using a unique name. Then, go to **http://research.fcprac.com**, and log in with your user name and password using Researcher Login in the lower left. Find this project title and click on **Submit a Report**. Update your profile information if needed, then upload this report as directed.

2009-2010 REPORT	CATEGORY (drop-down)	TODAY'S DATE (m/d/yr)
◉ *Quarterly Report* ○ *Annual Report* ○ *Final*	Leafminer	9/28/09

WHAT IS THE "HEADLINE" FOR THIS REPORT (e.g. a one-sentence "newspaper headline" describing what you accomplished)

Season-long mating disruption of citrus leafminer with an emulsified wax formulation of pheromone

TITLE and CONTACT INFORMATION

Proposal Title Development of effective citrus leafminer control with pheromone mating disruption

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Organization University of Florida/IFAS	*Total Direct Funds (current year)* 38245

REPORT UPDATE (650 words; provide details about your headline)

The citrus leafminer, Phyllocnistis citrella Stainton (Lepidoptera: Gracillariidae), is a major worldwide pest of citrus. Larval feeding by this insect facilitates proliferation of citrus bacterial canker, Xanthomonas axonopodis pv. citri. Most recently, we have achieved season-long disruption of P. citrella with a newly developed, emulsified wax dispenser of pheromone (SPLAT-CLM). A formulation containing a 3:1 blend of (Z,Z,E)-7,11,13-hexadecatrienal:(Z,Z)-7,11-hexadecadienal at a 0.2% loading rate of AI by weight and deployed twice per season (24 wk total) at 490g of formulation/ha caused season-long disruption of male moth catch in pheromone traps as well as reduced leaf infestation. Analysis of pheromone release from dispensers by gas chromatography revealed that effective disruption of P. citrella occurred at a deployment rate of 126 µg of (Z,Z,E)-7,11,13-hexadecatrienal/ha/h. Direct observation of moth behavior in the field suggested that disruption by this formulation occurred by a non-competitive mechanism. A formulation of the 3:1 attractive blend at a 0.02% pheromone loading rate caused only 2-6 weeks of disruption per deployment and did not reduce leaf infestation during mid- and end of the season evaluations. A formulation containing 0.2% of (Z,Z)-7,11-hexadecadienal alone and deployed at 490g/ha caused 6-7 wk of moth disruption to pheromone traps and did not prevent leaf infestation, while an identical formulation loaded with 0.02% (w/w) of (Z,Z)-7,11-hexadecadienal alone had no effect on P. citrella orientation to pheromone traps. The SPLAT formulation evaluated herein appears to be an excellent release device for (Z,Z,E)-7,11,13-hexadecatrienal given that approximately 100 d of steady release occurred following an initial brief (ca. 7 d) burst of higher release. The advantages of SPLAT as a formulation for P. citrella disruption include low cost of manufacturing, biodegradable and weather resistant characteristics, and flowability allowing machine application. Of the SPLAT treatments evaluated, the formulation containing a 3:1 blend of the two-component attractive P. citrella blend was the only one to cause season-long disruption as well as reduce leaf infestation. However, it required deploying 490g/ha of the SPLAT formulation containing 0.2% AI by weight twice per season, which amounts to deploying 2 g of P. citrella pheromone per ha per season. Although reduced P. citrella larval injury should contribute to reduced incidence of citrus canker infection, we were unable to document this hypothesis because the disease did not appear to be present in the citrus orchard where experiments were conducted. Mating disruption should be an effective alternative to insecticides for management of P. citrella and may reduce the incidence of citrus canker. Our ongoing investigations will continue to develop mechanized sprayers for optimizing deployment of this product. ISCA Technologies is in contact with the Florida citrus industry and working to get their mating disruption product registered for use in Florida citrus. Also, ISCA continues work on decreasing the cost of synthesizing the pheromone to make it more economically accessible. Although it is difficult to predict how long the registration process will take, we are hopeful that this product will be available for commercial use soon.