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*	Psyllid	10/15/09

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

Differences in psyllid susceptibility to insecticides found in different parts of the state

TITLE and CONTACT INFORMATION

Proposal Title Resistance and cross-resistance development potential in Asian citrus psyllid to insecticides and its impact on psyllid management

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Organization UF/IFAS/CREC	*Total Direct Funds (current year)* 140,315

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

The objectives of this project are establishing baseline toxicity data of various insecticides to field populations of the Asian citrus psyllid (ACP). Determining the resistance and cross-resistance development potential in field populations of the ACP and determining the mechanisms of insecticide resistance as part of insecticide resistance management program. Using a topical bioassay method, the baseline susceptibility data (LD50) have been generated for 14 insecticides that are labeled or in the process of labeling (chlorpyrifos, dimethoate, malathion, aldicarb, carbaryl, abamectin, bifenthrin, cypermethrin, fenpropathrin, lambda-cyhalothrin, acetamiprid, imidacloprid, thiamethoxam and spinetoram) for psyllid control in Florida citrus. The toxicity data of a laboratory strain which was established in 2005 and has not been exposed to insecticides were used for comparison. Bioassays were conducted on five psyllid populations collected from one grove each in five counties (Hendry, Indian River, Lake, Polk, St. Lucie) for determining the baseline susceptibility levels and to compare them with laboratory strain. In general, all five psyllid populations collected from five Counties showed decreased susceptibility to all the tested compounds compared with laboratory strain with few exceptions. The decrease in susceptibility to different insecticides was ranged from 1 to 34-fold (Hendry County); 1 to 18-fold (Indian River County); 1 to 14-fold (Lake County); 1 to 12-fold (Polk County); and 1 to 14-fold (St. Lucie County). For Hendry County psyllid population, the highest decrease in susceptibility was observed for imidacloprid (34-fold) followed by thiamethoxam (10-fold). For Indian River County psyllid population, the highest decrease in susceptibility was observed for chlorpyrifos (18-fold) followed by imidacloprid (10-fold). For Lake County psyllid population, the highest decrease in susceptibility was observed for imidacloprid (14-fold) followed by thiamethoxam (12-fold). For Polk County psyllid population, the highest decrease in susceptibility was observed for chlorpyrifos (12-fold) followed by imidacloprid (7-fold). For St. Lucie County psyllid population, the highest decrease in susceptibility was observed for chlorpyrifos (14-fold) followed by imidacloprid (9-fold). Psyllid populations from five Counties are still highly susceptible to most of the synthetic pyrethroids tested when compared to laboratory strain. Further work to screen psyllid populations collected from 4-5 different locations in Florida is under way for determining the baseline toxicity and monitoring resistance levels. In another study, two field colonies have been established in a greenhouse and are being subjected to imidacloprid or chlorpyrifos selection pressure in every generation for developing resistant colonies. This is because field collected psyllid populations from five Counties showed decreased susceptibility to imidacloprid and chlorpyrifos. These colonies will be used for further studies on determining the resistance and cross-resistance development potential in psyllids and mechanisms of resistance. Thus far selection of five successive generations has been completed for imidacloprid and a resistance level of up to 150-fold has been observed. Further selection of future generations and determining the mechanisms of resistance by toxicological and biochemical studies are under progress. The information from these studies should help monitor the onset and progress of resistance in psyllids to different insecticides which in turn will enable us to take remedial measures as part of insecticide resistance management program.