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	1/10/10

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

Small droplets appear to be more effective in psyllid control compared to larger droplets

TITLE and CONTACT INFORMATION

Proposal Title Evaluation and development of effective ultra low volume spray technologies for management of the Asian citrus psyllid

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Organization University of Florida, IFAS, CREC	*Total Direct Funds (current year)* $99058

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

Since an effective control of the Asian citrus psyllid (ACP) requires a large component of chemical insecticides, we have continued our research on different pesticide chemistries to further optimize low volume technologies used in the HLB management. These efforts have been conducted with a view to strengthening the case for low-volume registration of test formulations to the EPA, in addition to demonstrating the effectiveness of low-volume technology to the citrus industry. The work has involved both laboratory and filed studies. In the laboratory, we have used a controlled droplet application apparatus to generate different spray droplet sizes to investigate the effect of droplet size on the mortality of ACP using various commercially available pesticide formulations that are labeled for citrus applications.The technique involved spraying different droplet sizes on psyllid infested potted "Swingle" trees (8-inch) and counting the number of ACP eggs, nymphs, and adults before spraying and at 3 days and 7 days post-treatment. By varying the pesticide concentration, the amount of sprayed active ingredient was kept constant for all droplet size ranges. The pH of all the formulated products were measured to ensure label compliance and best spraying practice. To date, our results have shown that the smaller the droplet size, the greater is the percent mortality of all life stages of the ACP. The formulations examined have been: Danitol 2.4EC (synthetic pyrethroid), Lorsban Advanced (organophosphate), and most recently Dibrom 8E (organophosphate). For all chemistries, the results suggest up to 80 percent control of nymphs using droplets in the range of about 40 – 100 µm median diameter. Danitol and Dibrom produced this effect by day 3, with Lorsban taking until day 7. The egg and adult stages showed similar trends, but with greater levels of control. Nonetheless, due to the particle size of the pesticide ingredients in available formulations, not all products are suitable for implementation into this sensitive and precise system. Three other formulations have been screened for experiment this spring against the glasshouse culture: EverGreen (natural pyrethroid), AgriMek (abamectin), and Knack (pyriproxifen). In their present formulations, both Movento (spirotetramat) and Provado (imidacloprid) are not compatible with the laboratory droplet applicator. However, due to the importance of these active ingredients in the citrus industry, a dialogue with the appropriate formulation chemist at Bayer has begun with a view to using suitable formulations in the near future. Field trials of a number of candidate formulations were conducted in commercial groves using a truck mounted and modified Curtis Dyna-Fog® ULV applicator delivering 1-2 gallons per acre. The results showed that low-volume applications were effective in controlling ACP adults and nymphs. In the case of Delegate (spinetoram) and Lorsban, results against nymphs were comparable to that of high volume applications, except Delegate without crop oil. Also in this study, the low-volume application gave identical control against adults as the standard volume, with psyllid numbers remaining minimal for the 21 days of the study. The use of low-volume applicators in a citrus grove is a nascent technology and various refinements to the application technique have been made throughout the year, such as: reflective flagging tape for night time applications, installation of a throttle controller and use of a 50 mesh screen on the in-line formulation pump. Given the importance of droplet size rage in label limitations, droplet sizing technique of the ULV applicator was further refined in field experiments. The work involved measuring the air output of sprayer at various spatial distances and determining the most suitable location for sampling the spray cloud. Using a droplet sizing instrument, the volume median diameter of the generated droplets were about 53±3 micron at 5-ft distance. A revised protocol for use of the droplet generator and a manuscript for publication in the J. of Economic Entomology have been prepared. A poster outlining the results and experimental procedures was presented at the recent ESA meeting in Indianapolis.