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	5/20/10

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

Low volume application is effective in psyllid control

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

Overall goal of the project was to develop and/or optimize low volume spray application technologies for controlling psyllids in Florida citrus production. Our research included both laboratory and field studies. In the laboratory, first we tested several fluorescent tracers to develop a reliable methodology for qualitative and quantitative assessment of spray deposition in low and ultralow volume applications. We used a controlled droplet applicator to generate different spray droplet sizes to investigate the effect of droplet size on the mortality of ACP. The tests included various commercially available pesticide formulations that are labeled for citrus applications. The technique involved spraying different droplet sizes on psyllid infested potted trees (Swingle) and counting the number of ACP eggs, nymphs, and adults before spraying and at 3 days and 7 days post-treatment. We tested 'Lorsban Advanced' 'Danitol 2.4EC' (synthetic pyrethroid), 'Lorsban Advanced' (organophosphate), and 'Dibrom 8E' (organophosphate), each at six droplet sizes. Our results showed that the smaller the droplet size, the greater is the percent mortality of all life stages of the ACP. For all chemistries, the results suggested up to 80 percent control of nymphs using sprays with droplet VMD of about 40 – 100 µm. 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. Three other formulations screened were EverGreen (natural pyrethroid), AgriMek (abamectin), and Knack (pyriproxifen). Nonetheless, chemistries involving suspended particles could not be applied readily with our laboratory apparatus. In their present formulations, Movento (spirotetramat) and Provado (imidacloprid) are not compatible with the laboratory droplet applicator.

In the field, we continued comparing various available application technologies. In one experiment, we compared high volume (dilute) spraying with low volume applications. The test involved evaluating two cold foggers and a mist blower. We also conducted several field trials with our LV-8 low volume applicator, which is becoming commonly used in the Florida citrus industry. We have applied over 4o treatments in Florida citrus groves to optimize chemistries that are labeled for the psyllid control, such as Danitol, as well as testing of unlabelled compounds. For labeled compounds, we have investigated the effect of product rate and application timing. For unlabelled compounds, we have conducted efficacy testing at standard rates to generate the needed data for label changes. Thus far, we have found no difference in efficacy between the available technologies. However, we may find differences with some of the more selective chemistries, so we are continuing this research by investigating more pesticide modes of action. We have compared the insecticide residues achieved with low volume and standard airblast sprays and have found that the residues from low volume sprayers are lower than those from conventional airblast sprayer. We have also investigated several application parameters for optimizing low volume spraying. While certain insecticides have shown similar efficacies for spraying every row versus every other row or ground speed of 5 mph versus 5-8 mph, some chemistries have shown lower efficacies when spraying every other row or at higher ground speed. In terms of the application volume, we have not found a difference between 2 and 5 gallons per acre. However, one must stay above 2 gallons per acre to remain within the boundaries of current label guidelines. We are also currently investigating whether the rate of insecticide can be reduced with low volume spraying. Given the importance of droplet size rage in label limitations, we have further refined the technique for characterizing the droplet size range of the ULV sprays used in field application.