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)

Low volume sprays do not penetrate upper canopy of trees

Proposal Title

Improving psyllid management by optimizing 1) adjuvants for low volume sprays, 2) targeted border-row treatments, and 3) location of spray applications

Today's Date	Sponsoring Organization (drop-down)	Category (drop down)
1/27/12	Citrus Research and Development Foundation	Vector Management

REPORT UPDATE (500 words; summarize your accomplishments)

Low volume (2-10 gallons per acre) applications have been increasingly popular in the citrus industry due to their low operating costs and flexible nature. The rationale for this investigation was to gain better understanding of limitations and suggest improvements to the implementation of low volume applications in mature citrus groves and compare them to traditional high volume (ca. 200 gallon) techniques.

1) Leaf residue toxicity studies. The residue left on citrus leaves following applications kills psyllids for up to several weeks. We investigated longevity of activity for Asian citrus psyllid, using leaves from field trials with fenopropathrin (16 oz/acre), phosmet (1.5 lb/acre) and imidacloprid (15 oz/acre) after low and high volume applications. A bioassay was then performed with citrus leaf discs in a Petri dishes. Approximately 15 adult psyllids were placed in dishes with leaf discs of either treated or untreated leaves. Mortality was recorded at 24 h and 48 h intervals. The mortality of adult psyllids after 4 days was between 60 and 100% after high volume applications, but <10% after low volume applications. By day eight, only the high volume fenpropathrin treatment caused high mortality (80%). All other treatments tested showed <10% mortality. A residue trial of the adjuvant, Induce, was conducted with the insecticides fenpropathrin and chlorpyrifos at both low and high volume applications. At day three, discs from all treatments caused 100% mortality. Fenpropathrin + Induce low volume and high volume were the only treatments to cause adult mortality: 65 and 80%, respectively.

2) Border row treatment as a tactic for ACP management.

The purpose of this study was to investigate the application of border row treatments for psyllid management as compared with treating entire blocks. Psyllid numbers in both fully and border only treated blocks were significantly reduced by the applications three and seven days after application. On day 14, the border row treatment was not different from the control, while psyllid populations were still reduced in the fully treated blocks. These results indicate that border row treatment by low volume may have some use for up to two weeks after treatment, but is not as effective as treating entire blocks of citrus at the five acre replicate plot sizes that we tested.

3) The vertical distribution of adult psyllids in mature citrus.

Adult psyllid distribution within the canopy of citrus has has not been investigated thoroughly following applications of insecticides. Our season-long study revealed that there are up to three times more adult psyllids at ~3 m as compared with 1 m height within the canopy following insecticide treatment. Leaf disks from the top most leaves were previously shown not to be toxic to adult psyllids. A spray droplet penetration study was performed, using water sensitive paper (WSP) strips as an indicator of the presence of the spray cloud produced by the low volume machine. These strips were placed at three heights within the canopy of trees: 1.2, 2.1 and 3.2 m. Results revealed that droplets penetrated both sides of the leaf at 2.1 m only. At 1.2 m, only the upper surface received significant numbers of droplets. At 3.2 m, no droplets were detected. In summary the low volume technique, although rapid to deploy and characterized by low operating costs, results in lower penetration of the tree canopy as compared with high volume applications, which may explain the shorter longevity of efficacy of low volume applications as compared with standard sprays.

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SUBMIT REPORT

CITRUS RESEARCH AND DEVELOPMENT FOUNDATION, INC.