Improving Spray Deposition and Reducing Drift in Almond Orchards

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PROJECT SUMMARY

Objectives:

- Refine a retro-fit kit that adds a thin mast and hydraulically- powered fans to a conventional axial fan air-blast sprayer that will allow spray delivery from below and above the canopy.
- Integrate the novel sprayer into a commercial spray program and determine navel orangeworm control efficacy within lower and upper sections of trees for the modified sprayer compared to commercial sprayers operating without the modification.
- Determine if conventional spray application parameters can be modified to reduce spray volume and increase ground speed, thereby improving spray efficiency.

Background and Discussion:

This project brings together the skills and interests of three California research groups to look at improving spray applications.

Joel Siegel, USDA-ARS, has been monitoring the efficacy of applications of pest control materials for navel orangeworm (NOW) control in terms of reaching the target nuts. The USDA lab is set up to measure residues on nuts or other materials.

Ken Giles and Franz Niederholzer are interested in the efficacy of new spray technologies for tree crops - both for efficacy and reducing off-site movement.

James Markle is interested in finding techniques applicators can implement with current equipment to improve precision. CURES is involved with helping growers meet more stringent surface water quality standards.

In the previous project year, a conventional air-blast sprayer with an axial fan was modified by the addition of a 16-foot tower which supported two hydraulically-powered fans with radial spray nozzle manifolds.

This year, the project goal was to integrate the sprayer into a commercial, large-scale spray program in the industry. The sprayer was transported to the Lost Hills area and used for a commercial spray program. Mechanical durability was shown and use by commercial operators was successful. Pest control results are pending.

In order to determine if modified spray practices can result in improved spray efficiency, defined as less volume of water applied with faster ground speeds, a spray trial was conducted at Nickels Lab using Dow AgroSciences Delegate® WG insecticide (rate: 7 oz/acre). Three spray treatments were applied: a “standard” spray at 100 gal/acre at 1.75 mph, and two sprays (one charged and one uncharged) at 50 gal/acre and 3.3 mph. The lower volume, higher speed application was made with an air shear, tower type sprayer while the conventional spray was made with a typical axial fan center blower design.

At 1 and 14 days after application, samples of nuts were collected from upper and lower regions of the tree and transported to Dr. Siegel’s lab for analysis. Also, on the day after spraying, nut and leaf samples were collected from the upper and lower regions of the trees and analyzed for spray deposit using a metallic tracer.

Analysis of the sprayed nuts and leaves is underway and the results will be presented in the accompanying poster for this project.

Project Cooperators and Personnel: Joel Siegel, USDA ARS, Parlier; Franz Niederholzer, UCCE - Colusa/Sutter/Yuba Counties

For More Details, Visit

- Poster location 16, Exhibit Hall A and B during conference; or on the web (after January 2014) at www.almondboard.com/researchreports
- 2012.2013 Annual Report CD (12-WATER3-Giles-Markle); or on the web (after January 2014) at www.almondboard.com/researchreports
- Related Projects: 13-ENTO11-Siegel/Walse