Improving Efficacy of Spray Applications in Almond

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PROJECT SUMMARY

Objectives:

- Improve spray efficacy by assessing both spray drift and spray deposition to target area(s) together.
- Assess hull-split spray canopy penetration efficacy with different droplet sizes as well as new spray technology.
- Assess the economic and environmental benefits/costs of the various spray techniques.

Background:

This project brings together the skills and interests of three different research groups to look at spray coverage, pest control, and drift management in almonds.

Joel Siegel, USDA-ARS, has been monitoring the efficacy of applications of pest control materials for Navel Orangeworm (NOW) (*Amyelois transitella*) control in terms of reaching the intended target – the nuts (see 11-ENTO11-Siegel/Walse). The USDA lab is set up to measure residues on nuts or other materials.

Ken Giles is 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 reduce spray drift. CURES is involved with helping growers meet more stringent surface water quality standards.

In 2010, this project assessed hull split spray deposition onto the target nuts and spray drift comparing normal volume (100 gallons/acre -- gpa) to a lower volume spray application (50 gpa) using Brigade, a pyrethroid pesticide. A lower volume spray application is more economical in terms of time and fuel usage but the effects on spray coverage on the target and/or off-site are not clear. Pest control didn't differ between Brigade application at 50 gpa or 100 gpa, but control on nuts from the tops of the trees was less than on nuts from lower in the tree two weeks after spraying.

In the 2011 season, two tests were conducted with the goal of evaluating droplet size, tractor speed and nozzle set up.

In late May, spray coverage and drift from very small droplets vs. standard droplet sizes – all at 115 gpa – were tested in tall, mature trees. Sprayers were set up to deliver 2/3 of spray volume through the top half of the nozzles on the sprayer. Smaller nozzles deposited less spray material on leaves in the tops of the trees than did the standard sized droplets. Smaller droplets also produced less drift out of the orchard and spray fallout on the orchard floor.

In July, the influence of different ground speeds (1.8 vs. 2.4 mph) and nozzle set up (2/3 of spray in top quarter or half of nozzles) on NOW control was tested using Altacor® – a new "soft" pesticide. Lab tests of NOW survival on field sprayed nuts from high or low in the canopy was similar at one day after spraying. See final results at the poster session.

The results of this study will help growers improve spray distribution throughout almond trees and so provide more uniform pest control throughout the tree while limiting loss of pesticide from the orchard.

The project will also assess the use of fluorescent dyes or nutrient sprays as easier tools to monitor spray deposition compared to actual pesticides. These additional test results will help reduce the cost of future research on this important topic.

Project Cooperators and Personnel: Dan Downey UCD; Joel Siegel, USDA ARS, Parlier; Franz Niederholzer, UCCE, Colusa/Sutter/Yuba Cos.

For More Details, Visit

- Poster location 37, Exhibit Hall, Session 3; or on the web (after January 2012) at AlmondBoard.com/AICposters
- 2010 - 2011 Annual Report CD (10-WATER3.Giles-Markle); or on the web (after January 2012) at AlmondBoard.com/ResearchReports
- Related Reports: 11-ENTO11-Siegel