Poster Articles

Best Management Practices for Orchard Spraying: Protecting Water Quality in the Hood River Basin of Oregon, USA

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Introduction

There are approximately 15,000 acres of fruit orchards in the Hood River Valley requiring intensive pest management programs. Historically, these programs have relied heavily on the use of broad spectrum pesticides including organophosphate (OP) insecticides for control of arthropods pests. In 1999, water quality monitoring conducted by the Oregon Department of Environmental Quality (DEQ) indicated exceedences of state water quality standards for pesticides, including chlorpyrifos and azinphos-methyl, in area streams. Most pesticide applications are made with radial airblast sprayers. Drift from orchard spraying and runoff from mixing and loading sites were recognized as likely modes of water contamination.

Methods

An intensive outreach program supporting grower adoption of orchard pest management practices designed to protect water quality while providing effective orchard pest management was initiated by the Hood River Grower-Shipper Association (HRGSA) and OSU Mid-Columbia Agricultural Research and Extension Center (MCAREC). The outreach program combined the efforts of the HRGSA Best Management Practices (BMP) Project, which focused on BMPs for pesticide handling and application, and the Areawide II Pest Management Project, a complimentary program focused on alternatives to OP insecticides and integrated pest management (IPM) programs for key fruit pests.

Information was developed to support grower adoption of the BMPs and IPM programs. This information was communicated through presentations during annual grower meetings, field days, pesticide education trainings, one-on-one field visits, newsletters, and a website (http://community.gorge.net/hrgsa/BMPproject.html). Additionally, a grower handbook was developed that integrates the information on both the BMPs and IPM programs.

One of the main features of the handbook is an illustrated guide to best spray practices. These include cultural practices, mixing and loading, sprayer maintenance and calibration, and spray application practices for reducing water contamination from drift and runoff. These are practical, low- or no-cost, common sense approaches to pesticide use. A companion PowerPoint module was developed for presentations in pesticide education sessions. Handbook information on IPM practices includes alternatives to OP insecticides (including pheromone mating disruption for codling moth control) and an illustrated guide to accessing and using Web-based phenology models for orchard pest management.

Results

A survey of growers conducted in 2004 indicated increased knowledge of and adoption of BMPs. Water quality monitoring subsequent to 1999 by OSU and DEQ scientists indicated generally reduced frequency

and concentration for chlorpyrifos detections, but increased incidence of azinphos-methyl detections exceeding water quality standards. The latter probably reflects a recent reversal in a multi-year trend toward widespread adoption of pheromone mating disruption for codling moth control.

Conclusions

The BMPs for pesticide use and IPM programs including alternatives to chemical control are considered to be important components of a long term program for reducing pesticide loading of the environment while providing effective pest management. The development and adoption of improved pesticide application technologies is a necessary additional component. Funding for the HRGSA BMP Project expired in April 2004. The outreach program will continue, however, through ongoing Extension activities of the MCAREC and outreach efforts of the HRGSA.

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