California Department of Pesticide Regulation
Environmental Monitoring & Pest Management
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# MODIFIED USE OF GROUND WATER DETECTED PESTICIDES: COOPERATIVE STUDY WITH UNIVERSITY OF CALIFORNIA TO MONITOR EFFECTS OF APPLICATION TIMING ON CITRUS HERBICIDE SOIL DISTRIBUTION

## I. BACKGROUND

Large amounts of water can be applied to citrus for frost protection during winter. Since crop evapotranspiration rates are low in winter, losses of water to deep percolation could be large causing a concurrent increase in the potential for downward movement of pesticide residues. Consequently, pesticide applications that are made directly before frost protection irrigations pose a great risk to ground water because residues have little time to dissipate.

Currently, a project is being conducted by Neil O'Connell, a farm advisor in Tulare County specializing in weed control, and John Pehrson, an irrigation specialist with the University of California at Lindcove, to determine how timing of pesticide applications affects pesticide efficacy and movement in soil. However, current funding for this project severely limits the number of soil samples taken and the number of chemical analyses conducted. Additional resources with respect to soil sampling and chemical analyses would provide physical evidence on how differences in timing affects efficacy. This protocol provides for field and analytical support, using Department of Pesticide Regulation personnel, in order to obtain this additional data. Participation in this project by the Department is desirable

for a number of reasons. First, it provides an opportunity to develop information from an established orchard in a cost effective manner. Second, the data could provide the basis for a modified use recommendation that could be incorporated into Best Management Practices, regulation and/or the Department's ground water training offered to Pest Control Advisors. Lastly, our cooperation acts as a channel for education by supporting a project developed by local extension and university personnel.

## II. OBJECTIVE

To determine the effect of pesticide timing of citrus herbicide applications on downward movement of residues.

## III. PERSONNEL

Project Leader: John Troiano

Senior Scientist: Bruce Johnson

Participating Scientists: Neil O'Connell, Farm Advisor-Tulare County; John Pehrson, Irrigation Specialist-University of California; Marshall Lee, Senior Environmental Scientist, DPR; Mark Pepple, Associate Environmental Scientist, DPR.

Laboratory Liaison/Field Coordinator: Cindy Garretson

ANY QUESTIONS REGARDING THIS PROJECT, SHOULD BE DIRECTED TO MARK PEPPLE AT 9(16) 322-2395.

## IV. STUDY DESIGN

The ongoing project is located in a commercial citrus orchard in Tulare County. Treatments testing the effects of timing of applications have been

assigned in a furrow-irrigated portion of the orchard. Treatments are: 1) a single fall treatment of 80 WP simazine (80% active ingredient) at 5 lbs (product)/acre; 2) split applications of 2.5 lbs/acre applied once in the fall and then again in the spring; and 3) a single application of 5 lbs/acre applied in the spring. These treatments were applied in single strips covering 4 rows in the orchard. Two replicate soil cores will be taken at sites located approximately 5 trees in from the end of each side of the tree-row. Samples will be taken with hand augers down to 5 feet in 1-foot increments as follows. First, a cylindrical PVC plastic sleeve, 12 inches in length with an inner diameter of 4 inches, will be driven into the soil prior to sampling to prevent surface soil from falling into the borehole. Two 6-inch samples then will be taken with the auger inserted through the sleeve. The entire sample will be collected in a plastic bag. Excess soil from inside the sleeve will be manually removed down to the 1-foot depth using a clean plastic glove. The auger will be cleaned in soapy water, rinsed with well water, then with de-ionized water, and lastly washed with isopropanol before re-insertion through the sleeve into the borehole of the next 1-foot sample. Upon collection of subsequent 1-foot samples, loose soil will be removed from the auger by striking it with a rubber mallet after which the remaining soil will be placed into plastic bags and the auger washed again after collection of the second 6-inch sample.

Subsamples will be taken from each 1-foot sample that will be either stored at -4° C in glass jars until extraction for chemical analysis or air-dried and then stored in plastic bags at air temperature until analysis for texture and organic carbon content. Samples in each plot will be taken at two times, one in the fall prior to the fall application treatment and one in

the spring prior the spring application treatment. Data will be used to provide a graphic description of the location of residues from each treatment.

## V. BUDGET

| Fall Sampling | # | $ |
|---|---|---|
| Soil samples (immuno-chemical assay) ..... | 60 | 2,400 |
| QC samples ..... | 10 | 400 |
| Total | 70 | 2,800 |

| Spring Sampling | # | $ |
|---|---|---|
| Soil samples (immuno-chemical assay) ..... | 60 | 2,400 |
| QC samples ..... | 10 | 400 |
| Total | 70 | $ 2,800 |