California Department of Food and Agriculture
Environmental Monitoring and Pest Management
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GROUND WATER MONITORING SURVEY FOR CHLORTHAL-DIMETHYL IN AGRICULTURAL USE REGIONS OF CALIFORNIA

I. INTRODUCTION

Chlorthal-dimethyl (Dacthal®) is a selective pre-emergent herbicide used to control annual grasses and certain annual broadleaf weeds. It is registered for use on many vegetable crops such as broccoli, cauliflower, onion, and cabbage and is also used on certain field crops, nursery stock, and turf areas.

In 1989, the Environmental Protection Agency (EPA) conducted the National Pesticide Survey and reported finding chlorthal-dimethyl metabolites in two California municipal wells. Prior to this detection, chlorthal-dimethyl had not been found in California ground water except for its occurrence in two monitoring wells, both suspected of point source contamination (Cardozo, et al., 1988).

At present, available data has not demonstrated that chlorthal-dimethyl can be transported through soil to ground water as the result of agricultural use.

However, EPA's findings and California Department of Food and Agriculture's (CDFA) field investigations (Ross et al., 1988), suggest that chlorthal-dimethyl residues may have the potential to migrate from the application site. Therefore, the Environmental Hazards Assessment Program (EHAP) plans to conduct a ground water survey for chlorthal-dimethyl residues in well water.

II. OBJECTIVE

To conduct a ground water survey to test for the presence of chlorthal-dimethyl and its metabolites - monomethyl 2,3,5,6-tetrachloroterephthalate acid (MTP) and 2,3,5,6-tetrachloroterephthalic acid (TPA) - in counties of high to moderate use and/or where soils and hydrology suggest a potential for ground water pollution.

III. PERSONNEL

Sampling will be conducted by the California Department of Food and Agriculture's Environmental Hazards Assessment Program. Key EHAP personnel are as follows:

Randy Segawa - Overall Supervisor
Clarice Ando - Project Leader/Field Sampling
Bruce Johnson - Senior Staff Scientist
Nancy Miller - Lab Liaison/Quality Control
Madeline Ames - Agency and Public Contact
Paul Lee - Chemical Methods/Analysis

All questions concerning this study should be directed to Madeline Ames at (916) 324-8916, ATSS 454-8916.

IV. STUDY DESIGN

Annual pesticide use report information compiled by CDFA for 1986, 1987, and 1988 will be reviewed for chlorthal-dimethyl use. Since this pesticide is not a restricted material, reported use reflects only a portion of the total amount applied. Based in part upon this data, preference for sampling will be given to counties reporting high to moderate use and/or in areas considered vulnerable to ground water pollution. A vulnerable area is considered to to be a region with porous soil and having a shallow ground water table.

Sections within a targeted county will be identified and selected based upon reported past use of pounds of active ingredient. These levels will be plotted on a map on a township, range and section basis to be used as an aid in site selection.

Other parameters to be considered in site selection include well availability and well seal condition. Within a high use area, preference will be given to properly sealed wells located on a porous soil, over a shallow ground water table before selecting other well sites not meeting these conditions.

Using the above criteria, a maximum of 60 wells in six counties will be selected, sampling approximately ten wells per county.

V. METHODS

Ground water sampling will be conducted using standard EHAP procedures (Sava, 1986). Five replicate water samples and one field blank will be collected per well in one liter glass amber bottles. Samples will be placed immediately on wet ice and remain chilled until analysis.

VI. CHEMISTRY METHODS/QUALITY CONTROL

Chemical analysis will be performed by the CDFA laboratory using GC/MS methods. Water samples will be analyzed for chlorthal-dimethyl, MTP, and TPA with a minimum detection limit of 0.05 ppb, 0.1 ppb, and 0.1 ppb, respectively. APPL laboratory will also perform analysis on replicate water samples using GC/ECD methods. Samples will be analyzed for total chlorthal-dimethyl residue with a minimum detection limit of 0.01 ppb.

VII. TIMETABLE

Field Sampling - August 1990

Chemical Analysis - August/September 1990

Report - December 1990

VIII. REFERENCES

Cardozo, C., M. Pepple, J. Troiano, D. Weaver, B. Fabre, S. Ali, and S. Brown. 1988. Sampling for pesticide residues in California well water: 1988 update. CDFA Report No. EH 88-10. Sacramento, CA.

Sava, R. 1986. Guide to sampling air, water, soil and vegetation for chemical analysis. CDFA Report No. EH 86-07. Sacramento, CA.

Ross, L.J., S. Nicosia, K.L. Hefner, and D.A. Gonzalez. Volatilization, off-site deposition, dissipation, and leaching of DCPA in the field. CDFA Report No. EH 89-02. Sacramento, CA.