California Environmental Protection Agency
Department of Pesticide Regulation
Environmental Monitoring and Pest Management
830 K Street
Sacramento, California 95814-3501

STUDY 195: MONITORING OF GROUND WATER FOR SELECTED INSECTICIDES IN RED IMPORTED FIRE ANT TREATMENT AREAS

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I. INTRODUCTION

The California Department of Food and Agriculture (CDFA) along with several counties within the boundaries of the red imported fire ant (RIFA) infestation propose to use ground applications of insecticides including, but not limited to bifenthrin, chlorpyrifos, diazinon, fenoxycarb, hydramethylnon, and pyriproxyfen to eradicate manage RIFA infestations in California (Kim, 1999). The Environmental Hazards Assessment Program (EHAP) of the Department of Pesticide Regulation (DPR) will conduct well monitoring of selected areas within the infestation area to provide information on the concentrations of the above listed compounds in ground water. This monitoring plan is designed to collect ground water in areas where the water may be impacted by RIFA insecticide applications.

II. OBJECTIVE

The objective of this study is to monitor the concentrations of RIFA insecticides (chlorpyrifos, diazinon, bifenthrin, fenoxycarb, hydramethylnon, and pyriproxyfen) in well water over time in areas where use of the RIFA insecticides are relatively high.

III. PERSONNEL

This study will be conducted by EHAP under the direction of Kean S. Goh, Program Supervisor. Key personnel include:

Project Leader: Johanna Walters
Field Coordinator: Valerie Walsh
Senior Staff Scientist: John Troiano, Ph.D.
Statistician: Terrell Barry, Ph.D.
Laboratory Liaison: Carissa Ganapathy

Analyzing Laboratory:
California Department of Food and Agriculture, Center for Analytical Chemistry
Agency and Public Contact: Madeline Brattesani, Ph.D.

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IV. STUDY DESIGN

The majority of the RIFA infestation is in Orange and Riverside Counties, with residential RIFA finds in Los Angeles, Kern, and San Diego Counties. Application sites can range from individual mounds to entire parks or schools (Kim, 1999). Ground water sampling will remain within the treatment area of Orange and Riverside Counties and will be focused on areas with high use of the RIFA insecticides. Well site selection will follow the general guidelines listed for in Standard Operating Procedure (SOP) FSWA006 (Marade, 1998). Wells will be chosen based on their proximity to areas with high use of the RIFA insecticides

Once wells have been chosen, sampling will commence based on the guidelines outlined in SOP FSWA001.00 (Marade, 1998). Wells will be sampled annually; the number of sampling events will depend on the extent of the treatment program. Wells may be added or deleted from the monitoring plan depending on future accessibility and expansion of the high insecticide use areas.

V. SAMPLING METHODS

Prior to well sampling, permission from the well owner will be obtained. Wells will be run for a minimum of 10 minutes to purge the system of any standing water and to recharge with water from the aquifer. A field blank sample will be collected at each site to check for potential contamination. Well water will be collected from a suitable sample port, before any holding tank or chlorination port, and stored in amber glass bottles then sealed with a Teflon®-lined lid. Specific chemical analyses require the preservation of field samples by adjusting the sample pH between 3.5 and 3.0 using 3N hydrochloric acid. Samples will be transported and stored on wet ice or refrigerated at 5°C until extraction. Water will be analyzed for the RIFA insecticides: chlorpyrifos, diazinon, bifenthrin, fenoxycarb, hydramethylnon, and pyriproxyfen.

VI. CHEMICAL ANALYSIS

Chemical analysis on all RIFA insecticides will be performed by the CDFA's Center for Analytical Chemistry. Quality control measures are described in SOP QAQC001.00 (Segawa, 1995).

VII. DATA ANALYSIS

Concentrations of chemicals will be reported as micrograms per liter (µg/L) (equivalent to parts per billion). Results will be compared to the pesticide use reports to determine if the location of the sampling coincides with the reported high use areas.

REFERENCES

Kim, D. 1999. Monitoring surface Water for Selected Insecticides in Red Imported Fire Ant Treatment Areas California-EPA/ Department of Pesticide regulation. Environmental Hazards Assessment Program.

Marade, J. 1998. Selection of a Suitable Well Site. Department of Pesticide regulation. SOP FSWA006.

Marade, J. 1998. Well Sampling: Obtaining Permission to Sample, Purging, Collection, Preservation, Storage, and Documentation. Department of Pesticide Regulation. SOP FSWA001.00.

Segawa, R. 1995. Chemistry Laboratory Quality Control. Department of Pesticide Regulation. SOP QAQC001.00.