

Department of Pesticide Regulation
Environmental Monitoring and Pest Management
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Environmental Hazards Assessment Program Study # 169

MONITORING AIR CONCENTRATIONS OF PESTICIDES USED IN METHYL BROMIDE BUFFER ZONES

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I. INTRODUCTION

In 1994, the Department of Pesticide Regulation (DPR) put into place permit conditions for field, commodity, and other types of methyl bromide fumigation. Permit conditions include buffer zones which are areas maintained between the application site and places where people conduct certain activities or practices. These zones are established so that methyl bromide concentrations at set distances do not exceed a 24-hour time-weighted average concentration of 0.21 parts per million (ppm). This 0.21 ppm target level provides a one hundred-fold margin of safety to protect the public health. The size of the buffer zone varies based on the amount of time a person would normally spend doing a certain activity within the zone. The 0.21 ppm target level for methyl bromide is based on a 24-hour continuous exposure. For example, a person could be exposed to 0.42 ppm for 12 hours or 0.63 ppm for eight hours without exceeding the 0.21 ppm, 24-hour time-weighted average.

If an agricultural field that is to be fumigated is adjacent to lands used for other purposes, it may not be possible to meet the buffer zone requirements without leaving some of the field untreated. Growers could use other pesticides to treat buffer zone areas in order to maintain productivity of the entire field. Alternative pesticides may include fumigants such as ~~metam~~ sodium, chloropicrin, and 1,3-dichloropropene, or non-fumigant nematicides and pesticides.

II. OBJECTIVE

The objective of this study is to determine air concentrations associated with

applications of alternative pesticides in the buffer zone areas of a methyl bromide application.

III. PERSONNEL

This study will be conducted by personnel from the Environmental Hazards Assessment Program under the overall supervision of Randy Segawa, Senior Environmental Research Scientist.

Key personnel include:

Project Leader	Kevin Bennett
Senior Staff Scientist	Heinz Biermann
Field Coordinator	Dave Kim
Statistician/Modeler	Terrell Barry
Laboratory Liaison	Carissa Ganapathy
Analyzing Laboratory	California Department of Food and Agriculture, Center for Analytical Chemistry
Agency and Public Contact	Madeline Brattesani

All questions concerning this project should be directed to Madeline Brattesani at (916) 324-4100; e-mail: mbrattesani@cdpr.ca.gov.

IV. STUDY DESIGN

Sampling: Plan

For each application monitored, DPR will establish 8 - 16 monitoring stations around the field site. As air concentrations of the fumigants methyl isothiocyanate (primary degradate of metam sodium) or methyl bromide have been detected at distances of 0 - 300 feet from the edge of treated areas (California Air Resources Board, 1994; Wofford et al., 1994; Segawa and Wofford, 1997), four to eight stations will be established at 0 - 20 feet. Similarly, four to eight stations will be established 30 - 300 feet from the edge of the treated area. DPR will monitor each application for 24 - 96 hours.

Number of Samples (per application)

8-16 stations x 2-10 sample intervals = 16-160 samples

V. SAMPLING METHODS

Air monitoring will be conducted using appropriate sampling equipment and trapping media for the pesticide applied. Once samples are collected, each sample will be tightly sealed and placed on dry ice and remain frozen until analysis.

A weather station will be set up next to the treatment area to measure wind speed, wind direction, ambient air temperature, and relative humidity.

VI. CHEMICAL ANALYSIS

The California Department of Food and Agriculture Center for Analytical Chemistry will perform the chemical analyses. Extraction procedures and analysis will depend on the particular pesticide monitored. Matrix blanks and spikes will be analyzed as a quality control measure. Concentrations for multiple stage samples will be reported separately to document any breakthrough in the primary sample.

VII. DATA ANALYSIS

Results will be reviewed to determine possible off-site concentrations of pesticides used in the buffer zones of methyl bromide applications.

VIII. ESTIMATED TIMETABLE

Field Sampling	2/98 - ongoing
Laboratory Analysis	2/98 - ongoing
Data Analysis	3/98 - ongoing
Report Preparation	upon completion of each monitoring event

IX. REFERENCES

Air Resources Board. 1994. Ambient air monitoring for MITC in Kern County during Summer 1993 after a ground injection application of metam sodium to a field. Engineering Evaluation Branch, California EPA.

Segawa, R. and P.L. Wofford. 1997. Monitoring methyl bromide field fumigations during winter months. Memorandum to John Sanders, Environmental Monitoring and Pest Management Branch Chief Environmental Hazards Assessment Program, California EPA-Department of Pesticide Regulation.

Wofford, P.L., K.P. Bennett, J. Hernandez and P. Lee. 1994. Air monitoring for methyl isothiocyanate during a sprinkler application of metam sodium. Environmental Hazards Assessment Program, Report EH 94-02, California EPA-Department of Pesticide Regulation.