

Department of Pesticide Regulation
Environmental Monitoring Branch
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Collocation of Passive Canister Samplers with 1,3-dichloropropene Area monitoring by
Dow AgroSciences in Merced County
Study 272
April 2011

Introduction

1,3-dichloropropene (1,3-D) is a pre-plant fumigant used to control plant parasites and nematodes. Dow AgroSciences is sponsoring a year-long study to estimate concentrations of 1,3-D in a 9 township region of Merced County for verification of the SOFEA/ISCST3 air dispersion modeling system. Previous monitoring of 1,3-D has been conducted with 24-hour or less sorbent tube samples and canister samplers. The monitoring sponsored by Dow AgroSciences uses a sorbent tube to collect a 72-hour sample. DPR will collect three 24-hour canister samples to compare measured concentrations with the 72-hour sorbent tube results.

Objectives

Compare the results of two sampling methods for 1,3-D monitoring: air canisters and sorbent tubes.

Personnel

This study will be conducted by personnel from the Environmental Monitoring Branch under the overall supervision of Pamela Wofford.

Key personnel include:

Project Leader	Jessica Mullane
Senior Staff Scientist	Bruce Johnson
Statistician	Jing Tao
Laboratory Liaison	Sue Peoples
Analyzing Laboratory	C DFA Center for Analytical Chemistry

All questions concerning this project should be directed to Pamela Wofford at (916) 324-4297.

Study Design

DPR will setup canister samplers next to a sorbent tube sample at 3 locations. The canisters will be collected every 24-hours for a 3-day total concentration. DPR will compare the measured 1,3-D air concentrations using the two methods.

Sampling Method

Canisters will be placed as close as possible to the sorbent tube sample pumps so the two methods are collecting from the same height. Canisters will be placed at three of the sites used for the monitoring study. Samples will be collected for 24-hour periods starting when the sorbent tube sample begins. The canisters will be collected at the end of the 24-hour period and another will be set in place and started for a total of three canister samples.

Sample labels printed with the study number and a sample tracking number will be secured to the outside of all canisters. When air sampling commences at each monitoring site, the sample tracking number, date, time, staff initials, weather conditions, and air sampler pressure will be documented on a chain of custody (COC) form as presented in SOP ADMN006.01 (Ganapathy, 2004). At the end of each sampling period staff will record the date, time, staff initials, and ending pressure on the COC form. Weather conditions and other pertinent information that may affect sample results will be recorded on the COC or in a field note book.

Once samples are collected, the canister's flow will be closed. Canisters will be transported at ambient conditions. Sample handling-shipping and tracking procedures will be followed as defined in DPR's SOP QAQC004.1 (Jones, 1999) and SOP QAQC003.02 (Ganapathy, 2005), respectfully.

Chemical Analytical Methods

Chemical analysis for air canister samples will be performed by the California Department of Food and Agriculture Center for Analytical Chemistry. Canisters will be analyzed for cis-, and trans- 1,3-dichloropropene using a volatile organic compound method similar to U.S. EPA's Method TO-15. Method detection limit is determined as 0.132 ppbv or 599 ng/m³ and the report limit is 1.0 ppbv or 4,540 ng/m³.

Data Analysis

1,3-D concentrations will be compared to test if two sampling methods can detect the chemical at the same concentration levels. If not, the regression between results of two methods will be statistically analyzed. The correlation between two methods will also be estimated to demonstrate if they exhibit the same concentration trend along the sampling intervals.

Number of Samples

3 days/sample period x 4 sample periods x 3 sites = 36 primary samples

Timetable

April 1-30, 2011: Conduct sampling

May 2011 – July 2011: Obtain analysis results from CDFA laboratory

August 2011: Write analysis of study results