

PROTOCOL FOR THE 1980/81 MEDITERRANEAN FRUIT FLY ERADICATION SPRAY PROGRAM
MONITORING IN SANTA CLARA AND ALAMEDA COUNTIES

I. Objectives

To monitor the environmental fate within the treatment area of the various pesticides applied during the medfly eradication efforts.

II. Monitoring Plan

Five residences randomly selected within the treatment zone will be sampled. Samples will determine pre-spray background levels and the post-spray levels of Malathion for a period of 5 days following the final application and of Diazinon for a period of 14 days following the final application.

III. Personnel

The medfly eradication spray program monitoring study will be under the overall supervision of Ronald J. Oshima, Environmental Hazards Assessment Program (EHAP) (phone 714-787-4683 or ATSS 651-4683) and will involve cooperation from units within CDFA and the Medfly Eradication Project staffs. Key personnel participating from EHAP-CDFA are listed below, along with their responsibilities:

Lee Neher

Responsible for study design, all technical aspects used in sampling, supervision over the collection, storage and transport of samples, and dissemination of progress reports. Phone (714) 787-4684 or ATSS 651-4684.

Ingrid Carmean

Responsible for maintaining liaison within CDFA and between EHAP and the County Agricultural Commissioner's staffs. She will also be responsible for implementation of all technical aspects of the monitoring program, including site inspection, performing the actual sampling, collection and delivery of samples to Sacramento labs, and will be available in the study area for the duration of the monitoring study. Phone (916) 322-2395 or ATSS 492-2395.

Tom Mischke

Responsible for the selection of sampling methodology, preparation of sampling mediums, and liaison with Chemistry Laboratory Services for the chemical analysis of collected samples. Phone (916) 322-2395 or ATSS 492-2395



EHAP sampling personnel will consist of one crew of two people. It is understood that the Mediterranean Fruit Fly Eradication Project will assist in locating the five spray monitoring sites and aid in establishing liaison with County Agricultural Commissioner's staffs and cooperating parties (USDA, etc.).

IV. Study Timetable

Projected time for study is June 27 through September 1, 1981.

V. Sampling Methods and Monitoring Timetables

Samples will be collected at five randomly chosen Mediterranean Fruit Fly Eradication spray sites. Background samples of foliage, soil and ground cover (if applicable) will be collected at each site. Additional samples will be collected on the day of application, the day following, and every other day for period of 4 days after the final pesticide application with a follow up sample 14 days after the last application. Samples will be collected by EHAP personnel, sealed in glass jars and kept on dry ice during transit to the laboratory. Analysis will be performed for Malathion and Diazinon

PROTOCOL FOR DEPARTMENT OF FISH AND GAME
MALATHION RESIDUE MONITORING PROGRAM IN
AQUATIC ENVIRONMENTS, SANTA CLARA COUNTY

INTRODUCTION

On February 25, 1981 the California Department of Food and Agriculture (DFA) agreed with the California Department of Fish and Game's (DFG) concept to monitor Malathion residues in water and aquatic organisms of the Santa Clara Valley if the proposed aerial applications of Malathion to eradicate the Medfly become operational. On July 10, 1981 Governor Brown made the decision for aerial applications of Malathion with the first application to begin on July 14, 1981.

The present operational procedures of the proposed aerial applications justifies the need for such a monitoring program. Presently, none of the water bodies (with the exception of the potable water supply reservoirs) will be flagged (avoided) from the applications. Thus, Malathion contamination of the streams in Santa Clara Valley and South San Francisco Bay can be expected. Additionally, the proposed applications will be 7 to 10 days apart (substantially shorter than the expected Malathion half-life of 2 to 4 weeks), with up to 10 applications scheduled. Therefore, the distinct possibility exists that aquatic organisms in water bodies of the treated areas and South San Francisco Bay will be receiving continual exposures of Malathion for a period of at least four months.

The effects of this extended exposure to Malathion on the aquatic resources are not known at this time. However, if losses or significant Malathion contamination of aquatic resources occur, they must be documented so that the on-going application program could possibly be augmented (best management practices) to mitigate these effects.

The proposed water, sediment, fish, and shellfish monitoring program outlined in this proposal addresses the concerns of the State Water Resources Control Board (SWRCB) and the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB). Water, sediment, fish, and shellfish samples for Malathion residue analysis will be collected by DFG for analysis by DFA.

PURPOSE

The purpose of this study is to document potential losses of aquatic organisms and the Malathion residue levels in water, sediment, and aquatic organisms resulting from the proposed aerial applications of Malathion in Santa Clara Valley.

METHODS AND OBJECTIVES

I. Pre-treatment (baseline)^{1/} and Post-treatment Concentrations of Malathion in Aquatic Organisms.

A. Sampling Sites. seventeen sampling sites for water, sediment, and aquatic organisms in the study area (5 spray blocks) have been designated:

1. Block 1

Station D012 - Adobe Creek at Moody, Elena, and El Monte Roads Junction

Station D013 - Los Trancos Creek at Arastradero Road

2. Block 2

Station D023 - Permanente Creek at Cuesta Drive

Station D024 - Stevens Creek at El Camino Real

^{1/} It is realized that Malathion contamination may have already occurred as a result of the ground rig applications. Baseline water, sediment, and fish and aquatic invertebrates samples were collected on April 2 and 3, 1981 from Stations D039, D515, D516, D517, D518, and D519 and turned over to DFA for analysis.

3. Block 3

Station D036 - Stevens Creek at Stevens Creek Blvd.^{2/}

Station D038 - Saratoga Creek at Prospect Road

Station D039 - San Tomas Aquino Creek at Agnew Road^{2/}

4. Block 4 and 5

Station D410 - Los Gatos Creek at Hamilton Avenue

Station D411 - Ross Creek at Camden Road

Station D412 - Coyote River at Keys Story Road^{2/}

Station D413 - Coyote River at Old Oakland Avenue

5. Area 5 (South San Francisco Bay)

Station D515 - Coyote River at Gray Goose Slough^{2/}

Station D516 - Alviso Slough^{2/}

Station D517 - Guadalupe Slough

Station D518 - Mountain View Slough^{2/}

Station D519 - San Francisco Bay near Hooks Point

Station D520 - San Francisco near Coyote Point

B. Sample Timetables. Samples of water, sediment, and aquatic organisms will be taken beginning July 13, 1981 and continue based on spray schedules.

1. Water Sampling. The criteria for selecting water sampling stations are their location within a spray block or receiving runoff directly from a spray block and the occurrence of running water capable of supporting aquatic life. Water samples will be taken from all sites one day before and one day after each spray application in Blocks 1 through 5. Water samples in Area 5 will be taken one day before the

^{2/} Indicates biological, sediment, and in-situ bioassay sampling in addition to water sampling.

initial spray sequence and thereafter, one day after each spraying sequence ends. Rather than collecting water samples from the stations immediately after the spray application has been made (instantaneous maximum), this study is concerned with Malathion residues in the water bodies which may result from runoff in the spray area. Some of the water sampling stations may be dropped from the program pending correlation between DFA and DFG values for the water samples. Water samples will be collected in amber glass bottles supplied by DFA and kept chilled until analyzed.

2. Sediment Sampling. Sediment samples will be collected from Stations D036, D039 and D412 one day after each spray application in Blocks 3 and 4. Sediment samples will be collected from Stations D515, D516 and D518 one day after each spray sequence ends. Sediment samples will be placed in plastic bags and frozen in dry ice until analyzed.
3. Fish/Invertebrate Sampling. Representative native fish samples will be collected from Stations D036, D039, and D412 one day after each spraying application in Blocks 3 and 4. Fish and shellfish samples will be collected from Stations D515, D516 and D518 one day after each spray sequence ends. Fish and aquatic invertebrates will be double wrapped in aluminum foil and frozen in dry ice until analyzed.
4. In-Situ Bioassay. Bioassay live-cars will be placed at Stations D036, D039 and D412 and stocked with seven channel catfish. The cars will be stocked at one or two days before spraying begins in Blocks 3 and 4; the fish will be removed and replaced

with new fish 10 days later (one or two days before spraying begins again in that Block). The temperature, dissolved oxygen, pH, conductivity, and fish mortality will be monitored daily at the live cars stationed in Blocks 3 and 4. Bioassay live-cars will be placed at Stations D515, D516 and D518. The cars will be stocked with five anchovy, shiner surfperch or grass shrimp one day before the initial spraying sequence begins; the fish and shellfish will be removed and replaced with new organisms one day after each spraying sequence ends. The temperature, dissolved oxygen, pH, conductivity, and fish and shellfish mortality will be monitored at the live cars stationed in Area 5 when the organisms are replaced. The removed fish will be double wrapped in aluminum foil and frozen in dry ice until analyzed.

- C. Collection and Tissue Analysis. Resident aquatic organisms will be collected from each site and prepared by standard methods for analysis of Malathion. Although species substitution may be required, the organisms listed below will be collected as available.

<u>Station Number</u>	<u>Organisms</u>
D515, D516 and D518	Grass shrimp, <u>Cragon fransiscorn</u>
	Staghorn sculpin, <u>Leptocottus armatus</u>
	Starry flounder, <u>Platichthys stellatus</u>
	English sole, <u>Parophryus vetulus</u>
	Shiner surfperch, <u>Cymatogaster aggregata</u>
	Northern anchovy, <u>Engraulis morday</u>

<u>Station Number</u>	<u>Organisms</u>
D036, D039 and D414	Green sunfish, <u>Lepomis cyanellus</u>
	Carp, <u>Cyprinus carpio</u>
	Largemouth bass, <u>Micropterus salmoides</u>
	Hitch, <u>Lavina exilicauda</u>
	Bluegill, <u>Lepomis macrochirus</u>
	Sculpins, <u>Cottus gulosus</u> and <u>asper</u>

The grass shrimp and one fish species will be monitored at Stations D515, D516 and D518, and one or two fish species will be monitored at Stations D036, D039 and D412. Whole body grass shrimp and fillets of fish will be analyzed. A composite of 20 grass shrimp or more and five or more fish (depending on size) per station will be the preferred sample size for analysis. During each collection, water quality measurements of dissolved oxygen, temperature, and pH will also be taken at each site.

- II. Losses of Aquatic Resources. Losses of fish, shellfish and wildlife in the treated areas and in South San Francisco Bay will be documented on special forms. In the event of a loss, additional water and biological samples, and water quality measurements will be taken and analyzed to determine whether the loss was caused by Malathion or some other factor. These investigations will be coordinated with DFA.

- III. Implementation of Monitoring Study. The study will begin on July 13, 1981. At the present time, it is not known if all the operations scheduled for the stations can be successfully implemented, so the entire study is subject to change.

IV. Responsibilities. The Malathion Residue Monitoring Program will be under the overall supervision of Brian Finlayson, Water Quality Biologist, Pesticides Investigations Unit (phone 916-355-0136). This program will involve participation from several other state agencies and other units within the Department of Fish and Game:

Bill Jong

Responsible for field coordination for the water, sediment, and biological sampling program and maintenance and integrity of samples and data records.

Marc Shelden

Responsible for field collections of water, sediment, and biological samples. He is also responsible for delivering water and biological samples to Sacramento.

V. Report. All Malathion residue data from water, sediment, and shellfish samples will be returned to DFG, Pesticide Unit, for evaluation and preparation into a final report.

Department of Fish and Game
MEDFLY MONITORING PROGRAM
Report of Fish or Wildlife Loss

I. Specific Location: _____

II. County: _____

III. Major Cross Streets: _____

IV. Date of Loss: _____

V. Loss Reported By: _____

On: _____

VI. Species Loss Information (only those seen)

	<u>Species</u>	<u>Number</u>	<u>Size (cm)</u>
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____

VII. Samples Collected for Evidence

	<u>Sample Type</u>	<u>Number</u>	<u>Chain of Custody No(s)</u>	<u>Date</u>	<u>Analysis</u>	<u>Deposition</u>
1.	_____	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____	_____
4.	_____	_____	_____	_____	_____	_____
5.	_____	_____	_____	_____	_____	_____
6.	_____	_____	_____	_____	_____	_____

VIII. Investigative Observations

1. Size of loss area (length of stream, size of pond, depth of pond or stream, or acres involved, etc.): _____

