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Document Title:

STUDY 190: PROTOCOL FOR COLLECTING SURFACE WATER FOR THE ANALYTICAL METHOD DEVELOPMENT AND VALIDATION OF PERMETHRIN AND ESFENVALERATE, WINTER 2000

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December 30, 1999

I. INTRODUCTION

In the San Joaquin Valley use of permethrin and esfenvalerate has been on the rise increasing their importance as dormant sprays. Dormant sprays are generally applied with dormant oil on nut and stone fruit trees to control peach twig borer, San Jose scale, European red mite, and brown mite pests. The best time to achieve control of these pests is December through February, when trees are dormant and better pesticide coverage is possible (Zalom *et al*., 1995). However, the dormant spray application period coincides with seasonal rainfall. Thus, these pesticides have the potential to wash off the target areas and migrate with runoff waters into surrounding rivers. Currently we have no analytical method to detect these compounds in surface water. This study is designed to collect surface water during the dormant spray period for development and validation of analytical methods for permethrin and esfenvalerate.

II. OBJECTIVE

The objective of this study is to collect field surface water samples to develop and validate analytical methods for permethrin and esfenvalerate. Preliminary ELISA and gas chromatography confirmed with mass selective detector (GC/MS) will be tested using these field samples

III. PERSONNEL

This project will be conducted by the Environmental Hazards Assessment Program (EHAP) under the general direction of Kean S. Goh, Ag. Program Supervisor. Key personnel are listed below:

Project Leader: Johanna Walters
Field Coordinator: Valerie Walsh
Senior Scientist: Lisa Ross
Statistician: Terrell Barry
Laboratory: Bruce Hammock and Shirley Gee, University of California at Davis

Agency and Public Contact: Kean S. Goh (916) 324-4072 or
kgoh@cdpr.ca.gov

IV. STUDY PLAN

Based on pesticide use from December, January, and February 1998, two sites were chosen that reflect areas with the heaviest applications through the dormant spray period. Samples will be collected twice weekly at one site on the Stanislaus River at Ripon and at one site on the Merced River at the Milliken Bridge (HWY 165). Sampling will commence in the beginning of January 2000 and continue through the middle of March 2000.

V. SAMPLING METHODS

All water samples will be grab samples collected as close as possible to center channel. At each sampling site, four liters of water will be collected and will be split using a stainless steel funnel into four one liter amber bottles. Two bottles will be designated for permethrin analysis and two for esfenvalerate analysis. The two bottles for each analysis will be numbered the same and share one chain of custody. All samples will be stored on wet ice during transport and stored at 4°C until delivery to the laboratory for chemical analysis.

VI. CHEMICAL ANALYSIS

The University of California at Davis will perform chemical analysis using ELISA immuno-assay with LLD of 0.02 and 0.05 ppb for esfenvalerate and permethrin respectively and GC/MS with detection as low as 1-20 pg per injection.

Number of Chemical Analysis	
1 permethrin analysis per sampling event: 2 sites x 2 sampling events/week x 10 weeks	40
1 esfenvalerate analysis per sampling event: 2 sites x 2 sampling events/week x 10 weeks	40
Subtotal	80
Quality Control	
Continuing QC (approx. 10% of total chemical analyses)	8
Total number of chemical analysis samples	88

VII. QUALITY ASSURANCE/ QUALITY CONTROL

Quality control will be conducted in accordance with Standard Operating Procedure QAQC001.00. Ten percent of the total number of primary analyses will be submitted with field samples as blind matrix and rinse blanks. The total number of samples is presented above.

VIII. DATA ANALYSIS

Data from ELISA vs. GC/MS will be analyzed using linear regression and correlation.

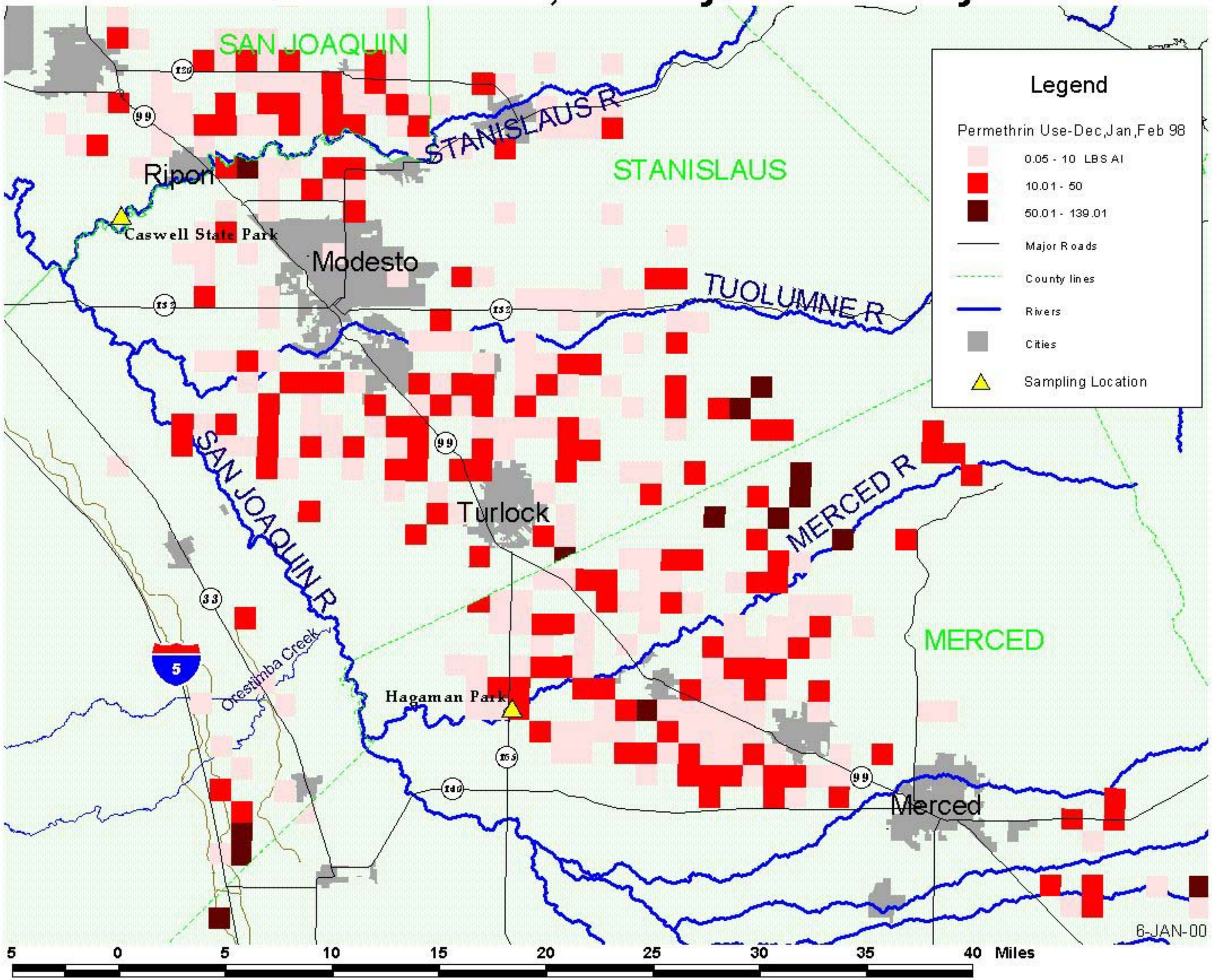
IX. BUDGET

Laboratory costs		= $5123
Salary for Johanna Walters (20 days x $119.36/day)		= $2387
Salary for Valerie Walsh (20 days x 78.44/day)		= $1569
Travel		= $1240
	Total	= $10,319

X. REFERENCES

Zalom, F.G., R.A. Van Steenwyk, W.J. Bentley, R. Coviello, R.E. Rice, W.W. Barnett, C. Pickel, M.M. Barnes, B.L. Teviotdale, W.D. Gubler, and M.V. McKenry. 1995. Almond pest management guidelines. Univ. of California, Division of Agriculture and Natural Resources, UCPMG Publication 1.

Permethrin Use December, January and February 1998



Esfenvalerate Use December, January and February 1998