



Department of Pesticide Regulation



Paul Gosselin
Acting Director

MEMORANDUM

Arnold Schwarzenegger
Governor

TO: John S. Sanders, Ph.D., Chief
Environmental Monitoring Branch

FROM: Randy Segawa, Senior Environmental Research Scientist *Segawa*
Johanna Walters, Environmental Research Scientist *Johanna Walters*
Shifang Fan, Associate Environmental Research Scientist *Shifang Fan*
Environmental Monitoring Branch
(916) 324-4100

DATE: September 17, 2004

SUBJECT: PRELIMINARY MONITORING RESULTS OF IMIDACLOPRID AND
CYFLUTHRIN APPLICATIONS FOR GLASSY WINGED SHARPSHOOTER
CONTROL IN A RESIDENTIAL AREA OF SOLANO COUNTY (STUDY 197)

Summary

On July 14, 2004, the Solano County Department of Agriculture's contract applicator applied imidacloprid and cyfluthrin to control the glassy winged sharpshooter in Vacaville, California. During this time, the Department of Pesticide Regulation (DPR) took tank, leaf punch, and air samples at one site in the treatment area. Air samples were taken before, during, and after the application. All air samples contained no detectable amount of imidacloprid or cyfluthrin. The tank sample had concentrations of 0.0023% and 0.0015% active ingredient of imidacloprid and cyfluthrin, respectively, versus the nominal label rate concentrations of 0.0028% and 0.0015%. Post application dislodgeable foliar residue from leaf punches had concentrations of 0.073 and 0.056 $\mu\text{g}/\text{cm}^2$ for imidacloprid and cyfluthrin, respectively.

Introduction

The Solano County Department of Agriculture is currently using foliar applications of carbaryl, imidacloprid and cyfluthrin along with soil injections of imidacloprid to control infestations of the glassy winged sharpshooter (GWSS). GWSS (*Homalodisca coagulata*) is a serious agricultural pest in California. When feeding it can transmit Pierce's disease, caused by the bacterium *Xylella fastidiosa*, to grapevines and other diseases to almond trees, alfalfa, citrus, and oleander. First found in the state in 1990, GWSS has spread throughout Southern California and into areas of the San Joaquin Valley.

The Environmental Monitoring branch of DPR has been monitoring selected treatments made in residential areas to provide information on the concentrations of carbaryl, imidacloprid, and cyfluthrin in air, surface water, and leaf residue. Additionally, tank samples are taken at each location where air samples are collected to verify application rates. Results reported in this memo are from imidacloprid and cyfluthrin applications on July 14, 2004, in Vacaville, Solano County. Sampling results and related GWSS monitoring reports are also available at DPR's Web site <www.cdpr.ca.gov/docs/gwss>.



Materials and Methods

Pesticide Application - In the city of Vacaville, Solano County, monitoring occurred at a residential senior care apartment complex sprayed on July 14, 2004 (Figure 1). Additional applications were made to neighboring apartment complexes on July 13 and 15, 2004. Solano County survey crews determined which properties were infested with GWSS and would receive pesticide treatment. Foliar applications of Merit® 75 WP (Bayer), 75% active ingredient of imidacloprid, and Tempo® Ultra WP (Bayer), 10.0% active ingredient of β -cyfluthrin, were made at a dilution of seven grams (five teaspoons) Merit® 75 WP and 37.8 grams (eight teaspoons) Tempo® Ultra WP per 50 gallons (187 liters) of water. Pesticide was delivered through a Wheaton® Treegun equipped with an odd eight nozzle tip attached to a 300 foot hose from a truck mounted power rig (consisting of a tank, motor, pressure gun, and pump). In addition to the foliar application, a soil injection of Merit® 75 WP was made to trees and shrubs at a dilution of seven grams (five teaspoons) per 50 gallons (187 liters) of water. Applications to the complex began around 847 hours with the soil injection. The foliar spray began around 950 hours and ended around 1115 hours. Three spray rigs were used, two for the foliar application and one for the soil injection.

Air Sampling - Ambient air samples were collected at one site in the apartment complex. A background air sample was taken prior to any treatments at the complex on July 13, 2004, near the main office of the complex. Air samples were taken during and for 48 hours following treatment of the complex, according to the following schedule: (1) duration of treatment plus one hour, (2) duration of 24 hours after treatment, (3) and another duration of 24 hours.

Samples were collected using XAD-2 resin tubes (SKC#226-30-02) and SKC air samplers (SKC#224-PCXR8) calibrated at a rate of approximately 3 liters-per-minute. The sampler was located outdoors in an open area. Samples were stored on dry ice until delivery to the California Department of Food and Agriculture's (CDFA's) Center for Analytical Chemistry for laboratory analyses. Imidacloprid on XAD-2 resin was extracted with methanol and analyzed using High Performance Liquid Chromatography (HPLC) with an ultra violet detector with a reporting limit of 0.5 μ g per sample. Cyfluthrin on XAD-2 resin was extracted with hexane and analyzed using a gas chromatography/electron capture detector with a reporting limit of 0.5 μ g per sample.

Tank Sampling - One tank sample were collected during the application. The sample was collected by dipping a 500-mL container into the applicator's tank. Tank sample was stored separate from other samples on wet ice until delivery to the lab for analysis. The tank sample was extracted with methanol and analyzed using HPLC with an ultra violet detector.

Leaf Sampling - Leaf samples were collected in close proximity to the site monitored for air. Foliage was sprayed by the same application tank from which the tank sample was collected. Samples consisted of 40 one-inch-diameter leaf punches collected into a four ounce glass jar and sealed with a Teflon® lined lid. Two samples were collected, one before application to the foliage (background) and the other after spray had dried, which was one hour after the application ended. Before and after treatment leaf punches were collected from the same plants, jasmine groundcover. Samples were stored on wet ice and delivered within four hours to the CDFA Center for Analytical Chemistry, and analyzed for dislodgeable foliar residue. Cyfluthrin and imidacloprid were extracted and analyzed from the same sample using a modified method for carbaryl and imidacloprid on dislodgeable leaf punches. Samples were washed with Surten® surfactant, extracted with ethyl acetate, and analyzed using HPLC with a fluorescence detector. The reporting limit was 0.0025 µg/cm² (micrograms per centimeter square).

Weather

The weather was generally clear, sunny, and hot on the application day. On July 14, 2004 temperatures ranged from 55 to 88 degrees F with a daily average wind speed of nine miles-per-hour from the south (CIMIS #121, Dixon).

Results and Discussion

Air - A total of four air samples were analyzed for imidacloprid and cyfluthrin. All air samples had no detectable amount of imidacloprid or cyfluthrin at a detection limit of 0.0116 µg/m³ for both chemicals.

Tank Mix - The tank sample had concentrations of 0.0023% and 0.0015% active ingredient of imidacloprid and cyfluthrin, respectively. Label rate for Merit® 75 WP (75% active ingredient of imidacloprid) is seven grams of product per 50 gallons of water for use on trees and ornamentals. Theoretical calculation of percent active ingredient was 0.0028% active ingredient. The range in label rates for application of Tempo® Ultra WP (10% active ingredient of cyfluthrin) to trees and ornamentals is 27.5 to 95 grams of product per 50 gallons of water, resulting in a range in the tank mix of 0.0015% to 0.0052% active ingredient. When tank mixed with other pesticides, the label for Tempo® Ultra WP restricts use to the most restrictive labeling directions and precautions.

Leaf Samples - Leaf punch samples of jasmine groundcover were collected from an area near the air monitoring site. The background sample had no detectable amount of imidacloprid or cyfluthrin. The post application sample had residues of 0.073 and 0.056 µg/cm² for imidacloprid and cyfluthrin, respectively.

Figure 1. Sampling site locations in an apartment complex in Vacaville.

