



# Department of Pesticide Regulation



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## MEMORANDUM

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SUBJECT: PRELIMINARY MONITORING RESULTS OF IMIDACLOPRID AND  
CYFLUTHRIN APPLICATIONS FOR GLASSY-WINGED SHARPSHOOTER  
CONTROL IN COMMERCIAL AREAS OF BUTTE COUNTY (STUDY 197)

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### Summary

During August 2001, the Butte County Department of Agriculture's contract applicators applied a tank mix of imidacloprid and cyfluthrin to control the glassy-winged sharpshooter (GWSS) in Chico, California. During this time, the Department of Pesticide Regulation (DPR) took air, tank, leaf, and water samples at several sites in the treatment area. Air samples were taken at one location, before, during, and after applications. No imidacloprid or cyfluthrin was detected in the air monitoring. Tank samples showed concentrations of 0.0031% and 0.0032% of imidacloprid active ingredient and 0.0008 and 0.0010% cyfluthrin active ingredient versus nominal label rate concentrations of 0.0031% and 0.0014% for imidacloprid and cyfluthrin, respectively. Dislodgeable foliar residue was analyzed for imidacloprid only. Post application samples had residues ranging from 0.050 to 0.071  $\mu\text{g}/\text{cm}^2$ . Additional samples were taken to determine dissipation at two sites. The four water samples collected had no detections of imidacloprid or cyfluthrin.

### Introduction

The County Department of Agriculture used foliar applications of imidacloprid and cyfluthrin to control infestations of the GWSS. The 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 and Sacramento Valleys.

The Environmental Hazards Assessment Program (EHAP) of the Department of Pesticide Regulation has been monitoring selected treatments in residential areas to provide information on the concentrations of carbaryl, imidacloprid, and cyfluthrin in air, surface water, leaves, and representative backyard fruits and vegetables. Additionally, tank samples are taken at locations



where samples are collected. Results reported here are from the application on August 11, 2001 in Chico, Butte County. Sampling results and related GWSS monitoring reports are also available at DPR's website <[www.cdpr.ca.gov/docs/gwss](http://www.cdpr.ca.gov/docs/gwss)>.

### **Materials and Methods**

**Pesticide Application** - In Butte County approximately 190 acres of highway, businesses, park, curbside, and parking lots were sprayed over two weeks. Imidacloprid and cyfluthrin applications by the county made to businesses, parking lots, curbsides, and to a small area in a public park began around 2:00 AM, August 11, 2001. Butte County survey crews determined which properties were infested with the glassy-winged sharpshooter. Applications of Merit® 75 WSP, with a 75% active ingredient, and Tempo® SC Ultra, with an 11.8% active ingredient, were made by two private pest control operators. Pesticides were tank mixed together in water at label rates of 1.6 ounces of Merit and 4.5 ounces of Tempo in 300 gallons of water and delivered through a D6 T Jet spray gun. The spray gun was attached to 300 feet of ½ inch hose from a truck mounted power rig (consisting of a tank, motor, pressure gun, and pump). Pressure was maintained around 135 pounds per square inch (psi) at the pump.

**Air Sampling**- Ambient air samples were collected at one site in Chico at a self-storage facility on Whitman Avenue. The application was made to this site beginning at 2:25 AM on August 11.

A background air sample was taken prior to any applications to the area August 10, 2001. Air samples were taken during, and for 48 hours following application, according to the following schedule: (1) duration of application plus one hour, (2) duration of 24 hours after application, (3) duration of 24 hours, and (4) another duration of 24 hours.

Samples were collected using XAD- 2 tubes (SKC#226-30-02) and an SKC air sampler (SKC# 224-PCXR8) calibrated at approximately 3 liters-per-minute. 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) Center for Analytical Chemistry for laboratory analyses. Imidacloprid on XAD-2 was extracted with methanol and analyzed using HPLC with an ultra violet (UV) detector with a reporting limit of 0.5 µg per sample. Cyfluthrin on XAD-2 was extracted with hexane and analyzed using a gas chromatography/electron capture detector with a reporting limit of 0.5 µg per sample.

**Tank Sampling** - Two tank samples were collected on August 11, 2001 from the two pest control operators. Samples were taken at the self-storage facility and at the south end of the Costco parking lot on Whitman Avenue. The samples were taken from the hose nozzle into a plastic 500-mL container and stored separate from other samples on wet ice until delivery to the lab for analysis. Tank samples were extracted with methanol and were analyzed using HPLC with an ultra violet detector.

**Surface Water Sampling** - Surface water samples were collected at two sites. Background water samples were taken prior to the beginning of application on August 10, 2001 at Little Chico Creek at Bruce St. and at Comanche Creek at Paseo Compañeros. Application samples were taken on August 11, 2001 following the termination of spraying in the area approximately five hours after applications began.

Samples at Comanche and Little Chico Creeks were taken by filling a ten-liter stainless steel bucket directly from the creeks. Water was then poured into one-liter amber bottles and sealed with a Teflon®-lined lid. Samples were stored on wet ice until delivered to the CDFA Center for Analytical Chemistry for analysis. Imidacloprid in surface water was extracted with methylene chloride and analyzed using HPLC with an ultra violet detector with a reporting detection limit of 0.05 ppb (parts per billion). Cyfluthrin in surface water was extracted with hexane and analyzed using a gas chromatography/electron capture detector with a reporting limit of 0.05 ppb.

**Leaf Sampling** - Leaf samples were collected at four sites; Chico Community Park, self-storage facility on Whitman Avenue, parking lot of the Food-4-Less on Whitman Avenue, and the south end of the parking lot of Costco on Whitman Avenue. Each sample consisted of 40 one-inch-diameter leaf punches collected into a 4-ounce glass jar and sealed with a Teflon®-lined lid. Samples were analyzed for imidacloprid; no method was available to analyze for cyfluthrin. Samples were collected prior to the application, after the spray had dried (approximately one to three hours after the application had occurred), and three days after the application. Additional dissipation samples were collected at the Community Park and the Costco parking lot on days 7, 10, 14, 21, and 28 post application. Additional samples were not collected from the self-storage facility and the Food-4-Less parking lot due to lack of vegetation. Leaf punches were collected from one type of plant within each site with the before and after application and dissipation samples at each site collected from the same plants. Samples were collected from a height range of zero to six feet. Samples were stored on wet ice and delivered within 36 hours to the CDFA Center for Analytical Chemistry (except for samples collected on August 10 and August 11, 2001 which were delivered to the laboratory on August 13, 2001) and analyzed for dislodgeable foliar residue. Leaf samples were washed with Surten®, extracted with methylene chloride, and analyzed using HPLC with a fluorescence detector. The reporting detection limit is 0.0012 µg/cm<sup>2</sup> (micrograms per centimeter square).

**Produce Sampling** - No produce sampling occurred during this application due to lack of available produce.

**Weather** - On August 11, 2001 temperatures ranged from 56 to 93 degrees and the daily average wind speed was 3 miles-per-hour (mph) from the southeast, skies were clear. Weather data is from CIMIS station #12, Durham (UCD, 2000 <[www.ipm.ucdavis.edu/WEATHER/wxretrieve.html](http://www.ipm.ucdavis.edu/WEATHER/wxretrieve.html)>).

### Results and Discussion

**Air** - There was no detectable amount of imidacloprid or cyfluthrin in the air samples collected at a detection limit of 0.5 µg per sample. Currently there are no established human health standards for imidacloprid or cyfluthrin in ambient air.

**Tank Mix** - Tank sample results were 0.0032 and 0.0031% active ingredient of imidacloprid for the self-storage facility and Costco parking lot samples, respectively. Label rate for Merit® 75 WSP, active ingredient of 75%, is 1.6 ounces Merit per 300 gallons of water as a foliar spray on landscape ornamentals. Theoretical calculation of percent active ingredient is 0.0031%

Tank sample results were 0.0008 and 0.0010% active ingredient of cyfluthrin for the self-storage facility and Costco parking lot samples, respectively. Label rate for Tempo® SC Ultra, active ingredient of 11.8%, is 1.5 ounces Tempo per 100 gallons of water as a foliar spray on landscape ornamentals. Theoretical calculation of percent active ingredient is 0.0014%.

**Surface Water** - All surface water samples collected had no detectable amount of imidacloprid or cyfluthrin at a detection limit of 0.05 ppb.

**Leaf Samples** - Imidacloprid was not detected in any of the background samples collected on August 10, 2001. The four post application leaf punch samples had residues ranging from 0.050 to 0.071 µg/cm<sup>2</sup> for imidacloprid with the highest residues found at the Costco parking lot. Table 1 displays results for all leaf punch samples collected.

Table 1. Concentration of imidacloprid in dislodgeable foliar residue, Chico, Calif. 2001								
Site	Plant type	µg/cm <sup>2</sup>						
		Day 1	Day 3	Day 7	Day 10	Day 14	Day 21	Day 28
Chico Community Park	Indian hawthorn	0.069	0.035	0.024	0.015	0.007	0.005	ND
Costco parking lot	Oleander	0.071	0.030	0.020	0.010	0.007	0.005	ND
Food-4-Less parking lot	Wax leaf privet	0.055	0.013	NS	NS	NS	NS	NS
Self-storage facility	Photinia	0.050	0.010	NS	NS	NS	NS	NS
NS = no sample collected								
Reporting detection limit is 0.0012 µg/cm <sup>2</sup>								

Imidacloprid and Cyfluthrin Monitoring Sites  
in the Glassy-winged Sharpshooter Treatment Area,  
Chico, Butte County, Calif., 2001

