



Department of Pesticide Regulation



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MEMORANDUM

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SUBJECT: PRELIMINARY MONITORING RESULTS OF CARBARYL APPLICATIONS
FOR GLASSY-WINGED SHARPSHOOTER CONTROL IN RESIDENTIAL
AREAS OF SANTA CLARA COUNTY (STUDY 197)

Summary

During July 2001, the Santa Clara County Department of Agriculture's contract applicator applied carbaryl and imidacloprid to control the glassy-winged sharpshooter in San Jose, California. During this time, the Department of Pesticide Regulation (DPR) took tank, leaf, and air samples at several sites in the treatment area for carbaryl. Air samples were taken at two locations, before, during, and after carbaryl applications. The highest concentrations occurred during applications and then declined over the next 72 hours. The highest concentration of 328 parts per trillion (ppt) detected was well below the preliminary health screening level of 6,313 ppt for acute exposure to carbaryl. Tank sample showed a concentration of 0.179% of carbaryl active ingredient versus nominal label rate concentrations of 0.11% to 0.21%. Dislodgeable foliar residue from leaf punches had concentrations of 3.55 and 4.27 $\mu\text{g}/\text{cm}^2$.

Introduction

The County Department of Agriculture is currently using ground applications of carbaryl foliar spray and imidacloprid soil injection to control infestations of the glassy-winged sharpshooter (GWSS). The glassy-winged sharpshooter (*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 Hazards Assessment Program (EHAP) of the Department of Pesticide Regulation (DPR) has been monitoring selected treatments in residential areas to provide information on the concentrations of carbaryl in air, surface water, leaves, and representative backyard fruits and vegetables. Additionally, tank samples were taken at each location where air samples were collected. Results reported here are from applications starting July 25, 2001, in San Jose, Santa Clara County. Sampling results and related GWSS monitoring reports are also available at DPR's website <www.cdpr.ca.gov/docs/gwss>.

Materials and Methods

Pesticide Application- In Santa Clara County approximately 13 residential properties and two ornamental strips were sprayed over approximately one acre in the Casa Alondra Mobile Home Park in the city of San Jose. The application began on July 25, 2001, with the residential properties and continued on July 26, 2001, with the park entrance and ornamental strips. Additional applications were made in an area one mile south of the Casa Alondra Mobile Park on July 26, 27, and 31, 2001. Santa Clara County survey crews determined which properties were infested with the glassy-winged sharpshooter. Applications of "7" Carbaryl Insecticide, with a 41.2% active ingredient, were made by a private pest control operator at a dilution of three teaspoons per gallon of water. Pesticides were mixed in water and delivered through a Bean Spray Wand with a #12 tip attached to a hose from a truck mounted power rig (consisting of a tank, motor, pressure gun, and pump). Applications were not made to the portion of trees above 15 feet.

Air Sampling- Ambient air samples were collected at two sites in San Jose, spaces #83 and #159 at the Casa Alondra Mobile Home Park. Carbaryl applications began on July 25, 2001.

Background air samples were taken prior to any applications at either site on July 24, 2001. Air samples at both sites were taken during and for 72 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 SKC air samplers (SKC# 224-PCXR8) calibrated at approximately 3 liters-per-minute. Samplers were located outdoors in open areas. 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. Carbaryl on XAD-2 was extracted with methanol and analyzed using high performance liquid chromatography (HPLC) with a fluorescence detector with a reporting detection limit of 0.2 µg per sample (reliable detection level).

Tank Sampling- One tank sample was collected during the treatment at space #83; the same tank was also used to spray at space #159. The sample was taken from the hose nozzle into a

plastic 500-mL container and was stored separate from other samples on wet ice until delivery to the lab for analysis. Tank samples are extracted with methanol and were analyzed using HPLC with an ultra violet detector.

Leaf Sampling- Leaf samples were taken at both sites monitored for air. Each sample consisted of 40 one-inch-diameter leaf punches collected into a 4-ounce glass jar and sealed with a Teflon®-lined lid. Two samples were collected from each site: one before application (background) and the other after spray had dried (generally one hour after the application ended). Leaf punches were collected from a citrus and a lilac bush. The post application samples were taken from a height range of zero to six feet from the ground. Samples were stored on wet ice and delivered within 36 hours to the CDFA Center for Analytical Chemistry 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/cm² (micrograms per centimeter square).

Weather- The applications monitored took place on one day for the two air monitoring sites. The weather was generally clear, sunny, and warm on the application day. On July 25, 2001, temperatures ranged from 58 to 79 degrees C with the daily average wind speed of 5 miles-per-hour (mph) from the north.

Results and Discussion

Air- A total of ten air samples were analyzed for carbaryl. Table 1 displays the results for the two air sampling sites. Air concentrations ranged from no detectable amount to 2.68 µg/m³ (micrograms per cubic meter). There were no detections of carbaryl in the background samples. The highest carbaryl concentrations were detected during applications with a general declining trend in the concentration over the four sampling intervals.

Since enforceable human health standards for carbaryl ambient air concentrations do not exist, DPR has developed screening levels to place results in a health-based context. Although not regulatory standards, DPR uses these screening levels to evaluate the results and take actions as needed. These screening levels represent the first tier in a risk evaluation and provide a context in which to view measured levels of pesticides in this project. A measured air level that is below the screening level for a given pesticide would not be considered to represent a significant health concern and would not generally undergo further evaluation, but should not automatically be considered "safe." By the same token, a measured level that is above the screening level would not necessarily indicate a significant health concern. This set of monitoring data is a measurement of acute exposure to carbaryl. The screening level for acute exposure to carbaryl is 51.7 ug/m³ (6,313 ppt) over a 24-hour period. The maximum concentration detected, 2.68 ug/m³ (328 ppt) is well below the screening level and does not represent a significant health concern.

Table 1. Concentrations of carbaryl in air, San Jose, Calif., 2001.

Sample Site	Application Date	Background	ppt ($\mu\text{g}/\text{m}^3$)			
			Interval I During Application	Interval II 24 Hours Post Application	Interval III 48 Hours Post Application	Interval IV 72 Hours Post Application
Space 83	7/25/01	ND ¹	321 (2.63)	42 (0.34)	39 (0.32)	34 (0.28)
Space 159	7/25/01	ND	328 (2.68)	66 (0.54)	69 (0.57)	55 (0.45)

Reporting limit is 6 ppt ($0.0007 \mu\text{g}/\text{m}^3$)

1. ND= non detected at the reporting limit (quantifiable concentration)

Tank Mix- One tank sample was taken for the application monitored. Tank sample result was 0.179% active ingredient of carbaryl. Label rates for “7” Carbaryl Insecticide®, active ingredient of 41.2%, generally range from 2 to 4 teaspoons (tsp) per gallon of water for most vegetables, berries, and fruit and nut trees. For control of leafhoppers on trees and ornamentals the label reports a rate of 2 tsp per gallon of water. Theoretical calculations of percent active ingredient for 2 tsp and 4 tsp of product per gallon of water are 0.11% and 0.21% active ingredient, respectively.

Leaf Samples- Leaf punch samples were taken at the two air monitoring sites. The background samples had no detectable amount of carbaryl. The two post application samples had residues of 3.55 and 4.27 $\mu\text{g}/\text{cm}^2$ for spaces #159 and #83, respectively.

Carbaryl Monitoring Sites in the Glassy-winged Sharpshooter Treatment Areas, San Jose, Santa Clara County, Calif., 2001

-  Major Roads
-  Treatment Area
-  Sampling Sites



0 1 Miles

