

## AREA-WIDE MANAGEMENT OF THE GLASSY-WINGED SHARPSHOOTER IN THE TEMECULA AND COACHELLA VALLEYS

### Project Leaders:

Raymond L. Hix	Nick C. Toscano	Carmen Gispert
Department of Entomology	Department of Entomology	UC Cooperative Extension
University of California	University of California	Riverside County
Riverside, CA 92521	Riverside, CA 92521	

**Reporting Period:** The results reported here are from work conducted from December 2002 to October 2003.

### INTRODUCTION

Riverside County has two general areas where citrus interfaces with grape: 1) the Coachella Valley with about 14,000 acres of table grapes and 12,000 acres of citrus; and 2) the Temecula valley with 1800 acres of wine grapes in proximity to 1600 acres of citrus. *Xylella fastidiosa* was recently recovered from the Coachella Valley (Perring and Gispert, unpublished), and the glassy-winged sharpshooter (GWSS) is very abundant. In Riverside County, table and wine grapes are the most vulnerable crops to GWSS as a vector of the bacterium *Xylella fastidiosa*, the causal agent of Pierce's disease (PD). Perhaps more than any other source, citrus is viewed as an important year round reproductive host of GWSS, but also one that concentrates GWSS populations over the winter months during the time that grapes and many ornamental hosts are dormant.

**Temecula.** The Temecula viticultural area was the first in California to be seriously impacted by the glassy-winged sharpshooter (GWSS) *Homalodisca coagulata* and the spread of *X. fastidiosa*, the causative agent for PD. While PD problems were first identified in 1996, it was realized by 1999 that the situation was dire. As a result, this ongoing cooperative demonstration project was initiated in 2000 to examine the impact of area-wide management strategies on GWSS populations and PD incidences in the Temecula Valley. The Temecula advisory committee consists of representatives from wine grape growers, citrus growers, University of California-Riverside, USDA, California Department of Food and Agriculture (CDFA) and the Riverside County Agricultural Commissioner's Office.

In the 2000 season, the opportunity to treat nearly the entire commercial citrus in the Temecula viticultural area was seized upon in an effort to destroy a substantial portion of the regional GWSS population. The emergency treatment of 1300 acres of citrus in Temecula, CA with Admire® (imidacloprid) during Apr and May 2000 represented a pivotal shift toward an area-wide management of GWSS. In March and April 2001, 269 acres of citrus were treated with Admire and an additional 319 acres were treated with foliar applications of Baythroid® on an "as needed" basis. Many grape growers treated their grapes with Admire and/or made foliar applications of Provado®, or Danitol® in 2002. Recommendations were made to remove sick vines in order to remove bacterial reservoirs. Though response was slow initially, growers are aggressively removing sick vines.

Although wine and table grapes are the most vulnerable due to the risk of PD, other crops were scrutinized for contributions to GWSS population growth. Citrus was the most important year long reproductive host of GWSS in Temecula. Citrus also seemed to concentrate GWSS over the winter months when grapes and most ornamental hosts were dormant.

**Coachella.** The table grape industry in the Coachella Valley is represented by 10,465 acres of producing vines, which generated grapes valued at \$108.5 million in 2001. GWSS was identified in the Coachella Valley in the early 1990's, and increases in the numbers of this efficient PD vector over the past 15 months have been documented. In July 2002, the occurrence of *X. fastidiosa* (PD strain) in 13 vines from 2 adjacent vineyards in the southeastern part of the Valley was confirmed. With this discovery, and the increasing numbers of GWSS, there was a real need for an area-wide GWSS and PD management program, to prevent the devastating epidemic like which occurred in Temecula. Clearly, there are no apparent biological or climatological factors that will limit the spread of PD in grapes in the Coachella Valley. Obviously, GWSS had the potential to develop high densities in the Coachella Valley.

### OBJECTIVES

The objectives of the Riverside County GWSS Areawide Management programs are:

1. Delineate the areas to be targeted for follow treatments to suppress GWSS populations in the Temecula and Coachella Valleys for the 2004 season.
2. Determine the impact of the 2003 area-wide management program on GWSS populations in citrus, grapes, and other plant hosts in the ecosystem in the 2003 season.
3. Determine the impact of the area-wide program on GWSS adult oviposition and nymphal development.
4. Determine the impact of the GWSS program on beneficial citrus insects, pest upsets and GWSS parasitism.
5. Evaluate the biological and economic effectiveness of an area-wide insecticide program of GWSS.

## RESULTS AND CONCLUSIONS

### Temecula

Based on trap and visual surveys in late 2002, 501 acres of citrus were targeted in 2003 with Admire and another 109 acres with Danitol® (pyrethroid). The success of the program over 2000, 2001, and 2002 suggests that this level of treatment in citrus every 3 years would keep GWSS populations suppressed in the Temecula viticulture area (Figure 1). This should be coupled with GWSS management within vineyards throughout the valley on a yearly basis. Recommendations were made to remove sick vines in order to remove bacterial reservoirs. Though response was slow initially, growers now aggressively remove sick vines.

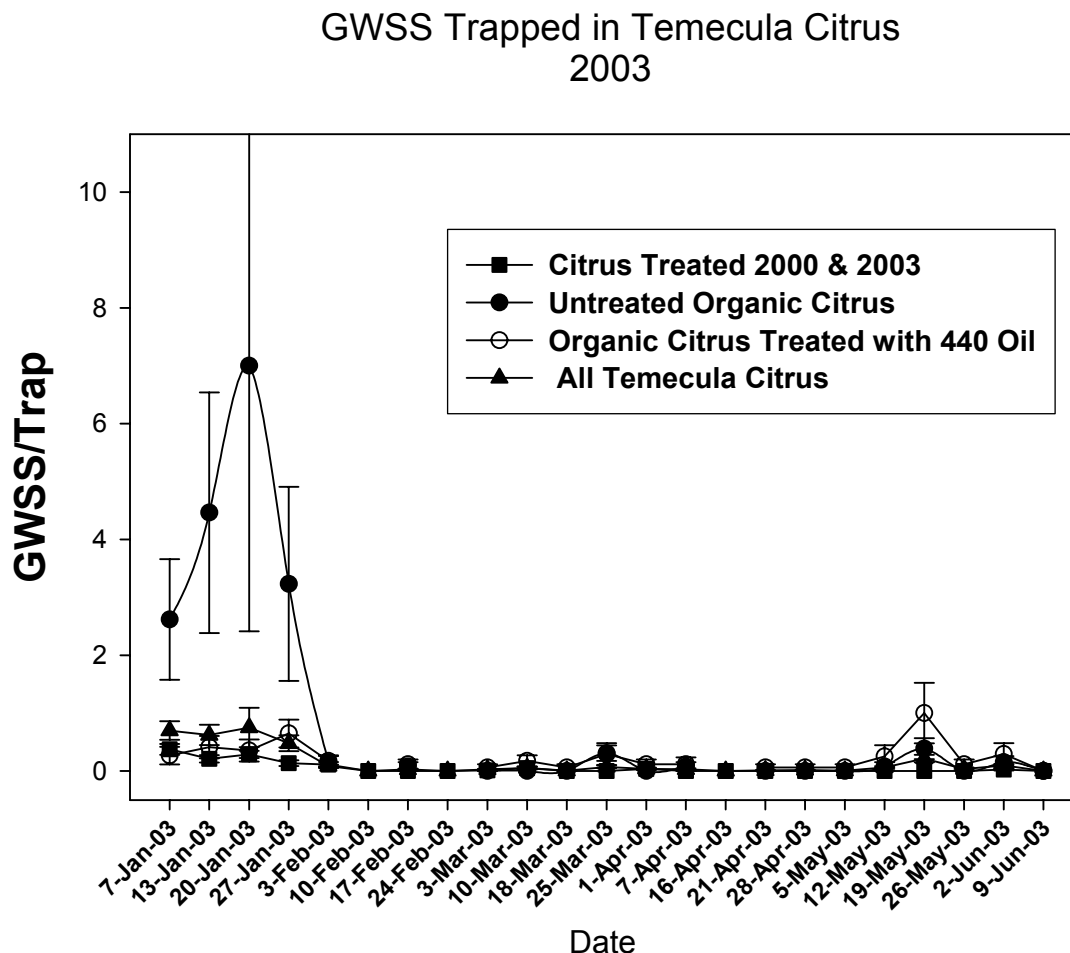
### Coachella

This program was officially initiated on February 10, 2003. With cooperation of the citrus growers, 10,312 acres of citrus were treated primarily with Admire (7,329.5 acres) and Assail® (acetamiprid) (2734.6 acres) by April 30. Assail treatments were used primarily in flood irrigated citrus groves by speed sprayer, or citrus interplanted in date gardens by handgun applications. By April 10, 2003, all groves with populations of GWSS were treated. Some of these Assail treatments were repeated in the summer as a precaution. Summer GWSS populations were suppressed in Coachella Valley citrus (Figure 2). The ironic fortune in Coachella Valley is that grape growers have been treating grapes for the vine mealybug for about eight years, which probably helped hold back a PD epidemic due to GWSS.

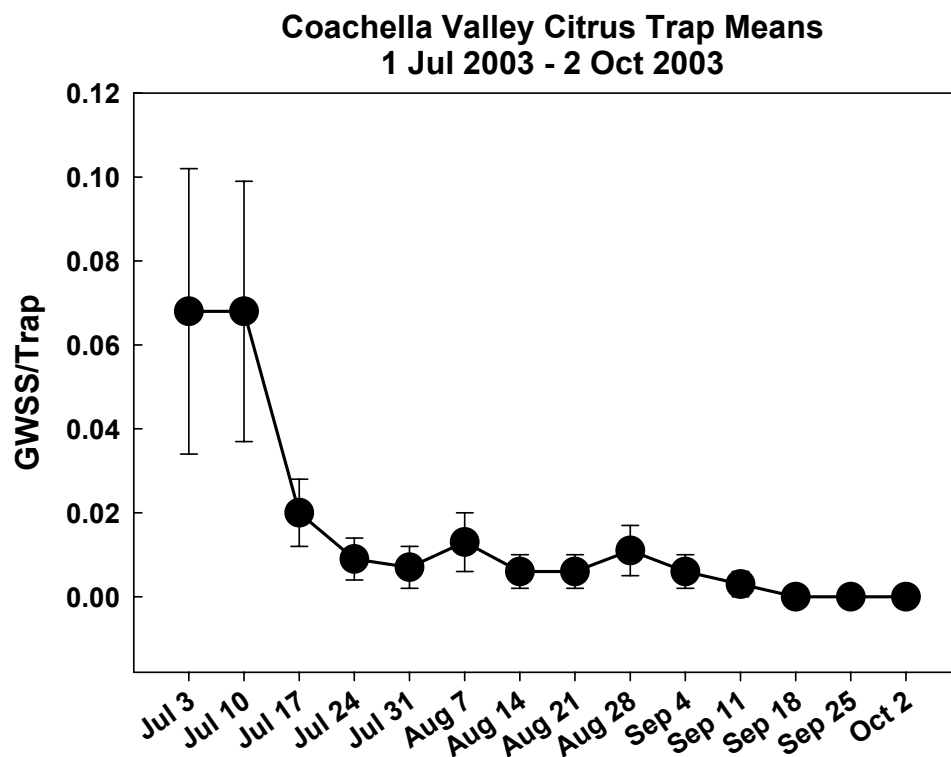
In order for areawide programs to be successful in areas with large acreages of citrus, these groves must be treated before the insects move into deciduous perennial crops and ornamentals after foliage development. If done on an areawide basis, groves don't have to be treated every year. Both organic citrus groves and organic vineyards pose challenges to areawide management programs (Figure 3).

## FUNDING AGENCIES

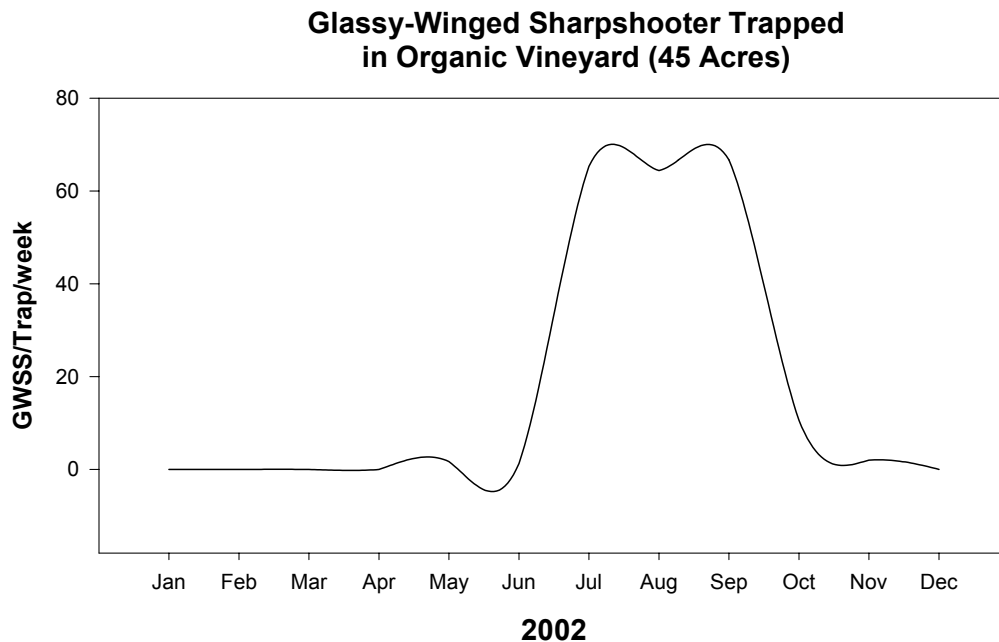
Funding for this project was provided by the USDA Animal and Plant Health Inspection Service, the California Department of Food and Agriculture, and Riverside County.



**Figure 1.** The majority of GWSS trapped in Temecula citrus were associated with untreated organic citrus when compared to organic citrus treated with 440 oil, or Admire in 2000 & 2003. N=250 for All Temecula Citrus ( $\pm$  SEM).



**Figure 2.** GWSS means for citrus in the Coachella Valley Areawide Program. N = 247 to 344 ± SEM.



**Figure 3.** GWSS trapped in an organic vineyard represented the largest population in the Temecula Viticulture Area for 2002.