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Kern/Tulare

GWSS Update

A project of the Glassy-winged Sharpshooter Task Force of Kern and Tulare Counties. Participants: Agricultural Commissioner Offices of Kern and Tulare Counties, California Department of Food and Agriculture, University of California-Cooperative Extension, U.S. Department of Agriculture (APHIS and ARS Divisions).

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General Beale pilot project expands scope with new emphasis on parasitoid releases in citrus groves

Parasitoid inoculated plants designed to seize window of opportunity in March

The General Beale Pilot Project is in its third year of delivery, testing various management strategies for controlling GWSS.

In 2001, USDA-APHIS scientists focused on identifying and using effective insecticidal management tools to rapidly reduce GWSS populations to low levels, minimizing the adverse impacts of the pest on affected commodities. The combination of a late winter foliar application to kill over-wintering adults and a spring application of Admire® to kill emerging nymphs proved to be very effective.

Ultimately, pest populations were reduced to undetectable levels, allowing citrus shipments to continue without delay, and the "vector potential" of the pest to transmit Pierce's disease to grapes was significantly reduced.

During 2002, only those groves and vineyards that showed a clear presence of GWSS and potential for re-infestation or population growth were treated. By the end of 2002, GWSS populations were below detectable levels using the standard beat net methods. However, sticky traps continued to sporadically capture adults at widespread locations indicating that very low level infestations continue to exist in the pilot project area.

Role of beneficial insects. One of the goals established early in the pilot project was to test beneficial insects and their abilities to attack GWSS, and to establish those species that demonstrate potential for population control. However, the over-arching goal of population suppression to minimize immediate crop impacts had to take precedence.

With this accomplished in the pilot project area, we will step up our efforts in 2003 in testing and establishing several parasitoid species.

Field studies of GWSS biology during 2001 and 2002 indicate that the majority of adults begin laying eggs around March 20 in the pilot project area, located southeast of Bakersfield. During the first two to three weeks, GWSS eggs are not heavily parasitized by the native *Gonatocerus ashmeadi.*

This lag period gives GWSS an opportunity to build high populations. It presents an *ideal window of opportunity* to introduce and possibly establish new species of parasitoids, especially species that may parasitize GWSS eggs under lower temperatures occurring in early spring.

Augmentative parasitoid releases. Several parasitoid species are being reared in different facilities located in California and Texas for field release throughout infested areas of California. Four native parasitoids currently reared at the GWSS facility in Mission, Texas, will be tested in the pilot project area. These include: *Gonatocerus ashmeadi* (Texas), *G. triguttatus* (Texas), *G. morrilli* (Texas), and *G. fasciatus* (Louisiana), all egg parasitoids.

Until recently, the parasitoids were released in relatively small numbers in select locations where researchers could monitor their establishment and role in controlling GWSS. The approach we intend to test within the pilot project area is considerably different in scope.

An augmentative release approach will be tested with these four species. The process begins with producing small *Euonymus japonica* plants, and allowing GWSS adults to lay their eggs on the leaves. They are then exposed to the parasitoids under laboratory conditions. Parasitized eggs are maintained in cold storage at 10 degrees Celsius to slow the development of the parasitoid within the GWSS egg, and to allow for "banking" the parasitoid inoculated plants (PIPs) over time.

Once placed under warm ambient

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temperatures again, the parasitoids will complete their development to adulthood and emerge from the egg masses.

Determining distribution rates. Given that GWSS numbers are much less than one adult per tree within the citrus groves in the pilot project area, we estimate that the number of egg masses will also be some fraction less than one per tree this coming March. Target release rates of one adult parasitoid per tree have therefore been chosen for this field trial. The distribution rate of parasitoids in a citrus grove will depend upon the number of parasitoids per egg mass.

Current ongoing laboratory tests will help us determine the prevalence of non-parasitized GWSS eggs in this system and potential survival of these eggs after several weeks in cold storage.

This information will be evaluated to determine whether or not emerging nymphs pose a significant re-infestation risk to citrus groves. If so, the plants can be treated with imidacloprid so that nymphal survival is controlled. Fortunately, field trials (reported in the *GWSS Update*, May 12, 2001) indicate that the use of imidacloprid is compatible with GWSS egg parasitoids.

Several techniques will be used to measure the success of this augmentation method, including but not limited to collecting resident egg masses from citrus trees, and placing host exposure plants with egg masses in the field to determine parasitism rates.

Grower cooperation. We will be contacting growers within the next several weeks, asking for their cooperation in allowing us to place the parasitoid inoculated plants in their citrus groves, and for taking follow-up measurements and samples. These evaluations will accomplish two things simultaneously:

1. comparatively test the abilities of several native species to attack GWSS eggs under actual field conditions;

2. provide an ideal window of opportunity for one or multiple species to become established.

Results of this field trial, and certainly others, may help develop biological control-based strategies for long-term sustainable control of GWSS.

— M. Ciomperlik & I. Lauziere, USDA-APHIS-PPQ

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Find GWSS program maps online

Maps for the Kern Pilot Project and Areawide Management Program are available at:

ftp://bigfoot.cdfa.ca.gov/