

Kern/Tulare

# GWSS Update



A project of the Glassy-winged Sharpshooter Task Force of Kern and Tulare Counties. Participants: Agricultural Commissioner's 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).

## Researchers find combination of neonicotinoids and kaolin film provides best protection against GWSS

A combination of neonicotinoids and kaolin film worked best to reduce glassy-winged sharpshooter (GWSS) density and lessen the incidence of Pierce's disease (PD) during three years of testing by University of California-Riverside researchers.

Between 2001 and 2003, project leaders Rick Redak and Matt Blua studied the impact of layering – or simultaneously implementing a variety of control tactics – on the spread of PD by the sharpshooter in vineyard test plots.

The neonicotinoid/kaolin film combination provided the best protection against GWSS, reducing population densities by about 90 percent. The same treatment combination reduced sharpshooter oviposition by 75 percent. Egg parasitism was unaffected by any of the treatments.

The layering of neonicotinoids and kaolin limited the incidence of PD to 30 percent after 18 months, although the incidence of the disease climbed to more than 70 percent in all treatments after 30 months.

Antibiotic therapy (metalosate), alone or in combination, did not affect PD occurrence. It also resulted in phytotoxic symptoms to treated plants.

"From a perspective of layering treatment combinations, this study did show a positive effect of combining treatments," said Redak, who is with the university's entomology department. "Using this approach, several distinct avenues of disrupting the disease transmission cycle were successfully utilized in combination."

In all three years, a combination of imidacloprid, acetamiprid and kaolin was most effective at reducing overall sharpshooter numbers. Plants treated with imidacloprid exhibited the lowest number of sharpshooters overall. It should be noted, however, that a significant number

of GWSS was found on all treated plants throughout the growing season.

"Within each year, differences among treatments were lost as sharpshooter numbers naturally declined at the end of fall," says Redak.

**Working in sync.** Redak said it was clear from the density data that both neonicotinoids and kaolin particle film reduced the number of insects on a given plant host. A reduced number of vectors necessarily reduces the probability of disease transmission and acquisition.

Secondly, once on the plant, the use of imidacloprid disrupts the feeding biology of the sharpshooter, resulting in reduced feeding times as well as the amount of time the insects' mouthparts are in contact with plant vascular tissue.

The diminished chances of PD transmission and acquisition result from:

- deterring adults from alighting on plants treated with neonicotinoids and particle film, or kaolin;
- direct mortality of insects feeding on neonicotinoid-treated plants;
- reduced feeding (and thus, reduced disease transmission) on plants treated with neonicotinoids and particle film.

**Research conditions.** The study was intentionally conducted under very high densities of GWSS on the UCR campus. Several hundred acres of citrus sat about 500 meters north of the vineyard test plots. A eucalyptus tree grove infested with GWSS lay to the south.

The high-density area resembled "the sharpshooter situation in Temecula in 1999 and 2000," Redak says. He and Blua also were interested in testing the efficacy of their control tactics "under a worse-case scenario."

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## Moving ahead with 2004 Bulk Grape Shipment Program

The 2004 Bulk Grape Shipment Program will move ahead with these provisions:

- No live GWSS shall be shipped out of an infested area to a non-infested area.
- 1) All vineyards within the infested area that ship to a non-infested area shall be under a compliance agreement with the origin county.
  - 2) The bulk grape shipment will be accompanied with a certificate (yellow tag). There will be no green tags. If you need to order yellow tags, please contact Pat Thalken at (916) 322-2804.
  - 3) The receiver shall have a compliance agreement with the receiving county and the receiving county will trap said facilities.
  - 4) Any questions, please contact your local PDP District Reps.

Thank you, and let us hope and pray for another successful GWSS-free season.

—Sean Hardy, CDFA



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Several treatments significantly reduced the incidence of PD symptoms in experimental plants during the first 18 months of the study. These treatments included:

- imidacloprid at full rate
- kaolin
- kaolin plus metalosate
- imidacloprid plus acetamiprid plus kaolin
- imidacloprid plus acetamiprid plus metalosate
- imidacloprid plus kaolin plus metalosate

“Unfortunately, the incidence of PD was relatively high, at 30 percent, even in the most successful treatment,” Redak notes. “Furthermore, after 30 months, all treatments were showing very high levels of

PD, at greater than 70 percent incidence.”

Redak also points out that no experimental treatment has yet resulted in complete protection from GWSS. “Consequently, all treated plants remain at risk of exposure to *X. fastidiosa*,” he adds.

“Still, we’re encouraged that our layering approach may prove effective in controlling PD in grapes under a substantially lower density of sharpshooters in the surrounding vegetation,” says Redak.

Further studies are required to evaluate treatment layering as a viable option in managing PD under conditions of lower insect vector density.

You can reach Rick Redak at [richard.redak@ucr.edu](mailto:richard.redak@ucr.edu).

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— Rick Redak,  
University of  
California-Riverside