

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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## Pilot project studies field efficacy of GWSS parasitoids

Although hampered by poor weather conditions, a biological control effort using mass releases of parasitoids conducted in Kern County's General Beale Road Pilot Project this spring offered an important learning experience for GWSS researchers.

The study, conducted from March 25 through May 9, used parasitoid inoculated plants in citrus plots in the pilot project area southeast of Bakersfield. These host plants were exposed consecutively to mature GWSS and to parasitoid females for oviposition.

Isabelle Lauziere and Lloyd Wendel, both with USDA-APHIS-PPQ's GWSS Emergency Program, conducted the research. Colleague Matt Ciomperlik and his assistants provided and distributed the parasitoid inoculated plants.

**The process.** Each plant carried at least one GWSS egg mass and was exposed to one of four parasitoid species: *Gonatocerus ashmeadi*, *G. morrilli*, *G. triguttatus* (each a Texas variety) and *G. fasciatus* (from Louisiana). All are Hymenoptera, Mymaridae that researchers wished to compare under field conditions.

About 2,750 *Euonymus japonica* plants were produced at the USDA-APHIS-PPQ, GWSS laboratory in Edinburg, Texas

for the study. These were cold stored at 10°C (50°F) throughout the winter months to prevent parasitoid development to adulthood. This process allowed a large number of parasitized egg masses to accumulate. The plants, also treated with Marathon® prior to field release, were placed in 16 citrus plots in the General Beale Road area. A density of one plant per 15 trees was used per treatment.

The parasitoids were allowed to emerge and search for GWSS eggs under a natural setting. About 3,400 egg masses were used, equaling 34,000-35,000 parasitoids.

Parasitoid emergence and host-searching behavior were monitored through the beginning of May using GWSS sentinel egg masses. Subsequently, 35 percent of the inoculated plants were recovered. All egg masses were dissected under microscope to evaluate the initial percentage of parasitism and insect field emergence for each of the four parasitoid species.

**Results.** Parasitism efficacy under laboratory conditions ranged from 40-60 percent of GWSS eggs according to parasitoid species (Table 1). *Gonatocerus*

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—Isabelle Lauziere, USDA-APHIS-PPQ

**Table 1: Evaluation of the percent parasitism and emergence of four parasitoid species released on inoculated *Euonymus japonica* liners placed in 16 citrus plots in the Pilot Study, Kern County, Calif., from March 25 through May 9, 2003.**

Parasitoid species	Total number of parasitoid inoculated <i>Euonymus</i> released (egg masses)	Total number of <i>Euonymus</i> recovered (dissected egg masses)*	N	% parasitized GWSS eggs	N	% parasitoid emergence ^
<i>G. ashmeadi</i> TX	734 (854)	276 (356)	2,425	69.7	254	10.5
<i>G. fasciatus</i> LA	656 (833)	180 (210)	991	44.4	344	34.7
<i>G. morrilli</i> TX	700 (839)	236 (302)	1,675	61.9	296	17.7
<i>G. triguttatus</i> TX	662 (844)	257 (329)	1,407	43.3	205	14.6

\* All 4 replicates pooled

^ Expressed as the number of GWSS eggs presenting emergence holes



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*ashmeadi* and *G. morrilli* parasitized about 20 percent more eggs than *G. fasciatus* and *G. triguttatus* under similar rearing conditions.

Throughout the release and evaluation period, ambient daytime and nighttime temperatures matched those used for extended cold storage of the four parasitoid species.

"It's therefore no surprise that only about 17 percent of all parasitoids emerged from GWSS eggs," says entomologist Lauziere.

Parasitoid emergence under field conditions ranged from 10-35 percent of parasitized eggs according to parasitoid species. *Gonatocerus fasciatus* and *G. morrilli* best completed their development and emerged as adults. *G. ashmeadi* ranked last for its ability to emerge at the observed temperatures.

"The number of *G. fasciatus* that emerged is under-evaluated because this species is a gregarious parasitoid and more than one parasitoid could emerge from the same emergence hole," Lauziere says.

Five consecutive evaluations took place using *Euonymus* and citrus sentinel egg masses monitored on a three- to six-day period according to weather conditions. Four control plots (where no parasitoid was released) were also monitored

throughout the study.

Parasitoids emerged from only seven of the *Euonymus* egg masses. These parasitoids were all *G. morrilli* and all from the April 11-18, 2003 evaluation period. In two cases, *G. morrilli* parasitized GWSS eggs in two control plots, both adjacent to *G. morrilli* release plots.

No parasitoid emerged from the citrus egg masses and no other parasitoid was recovered in any plot. These results suggest the emerged parasitoids were either unable to detect the available egg masses or did not live long enough to produce the next generation.

**Learning experience.** "Even though parasitoid recovery was not successful and no meaningful comparison can be made between these parasitoid species, this spring's biological control effort remains a learning experience," Lauziere says. "A mass rearing system was put to test. Helpful information was gathered that will be used to continue developing and improving our biological control program against the GWSS."

Problems encountered at the field level during this study included unusually cold spring temperatures, snails and other predators, such as ants, that damaged the plants. Researchers also encountered difficulty in maintaining plant soil moisture when placed in cups on trees, and harvesting crews removing sentinel plants. ■

**Table 2: Mean temperature and relative humidity observed from March 25 through May 9, 2003, in the Pilot Study, Kern County, Calif.**

Month	Temperature (°C)		Relative humidity	
	Daytime	Nighttime	Daytime	Nighttime
March	20.1	12.2	38.3	64.9
April	15.6	11.4	56.8	74.2
May	15.6	12.8	60.4	71.0

### Find maps of GWSS county projects online

The Area Wide Management Maps for the Kern County Project for the week of July 14-18, 2003 are now available at: <http://www.cdca.ca.gov/phpps/pdcp/gwMaps/gwMgmtMaps.htm>

The Area Wide Management Maps for the Kern Urban Trapping for the week of July 14-18, 2003 are now available at: <http://www.cdca.ca.gov/phpps/pdcp/gwMaps/gwKernUrban.htm>

The Area Wide Management Maps for the Tulare County Project for the week of July 14-18, 2003 are now available at: <http://www.cdca.ca.gov/phpps/pdcp/gwMaps/gwTulareCty.htm>

The Area Wide Management Maps for the Ventura County Project for the week of July 14-18, 2003 are now available at: <http://www.cdca.ca.gov/phpps/pdcp/gwMaps/gwVenturaCty.htm>