SEASONAL CHANGES IN THE GLASSY-WINGED SHARPSHOOTER'SAGE STRUCTURE, ABUNDANCE, HOST PLANT USE, AND DISPERSAL

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Reporting Period: The results reported here are from work conducted from November 2001 to October 2002.

OBJECTIVES

1. Develop a technique to rapidly mark adult GWSS for release-recapture studies.
2. Develop a sampling system for eggs of GWSS and monitor GWSS egg density on citrus.
3. Monitor adult movements of GWSS.

RESULTS AND CONCLUSIONS

We have completed our laboratory and field experiments verifying the stability of fluorescent dust as a method for marking the glassy-winged sharpshooter. We know that the marks will last for at least 30 days and for as long as 80 days under field conditions. Adults captured during the summer months readily survived the capture and marking process. In contrast, the few adult GWSS we captured at the UCR Agricultural Operations citrus groves during the winter months survived poorly after we marked them, probably from age and the stress of being captured and marked. However, Figures 1 and 2 show that the marked and unmarked control GWSS survived equally well. This was true for newly emerged adults collected during summer (Figure 1), and for over wintering adults (Figure 2).

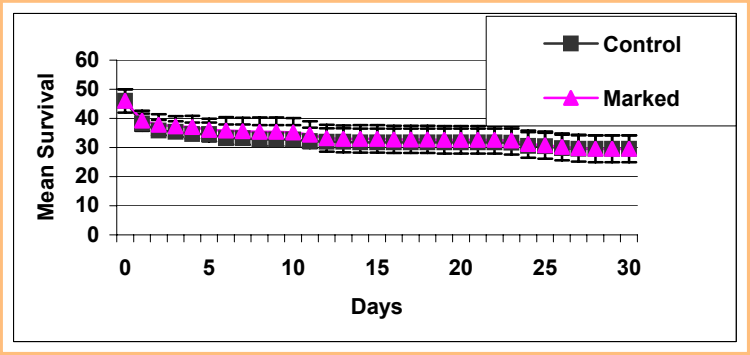

Figure 1. Mean survival of adult GWSS with standard error bars. Insects were collected during July and August.

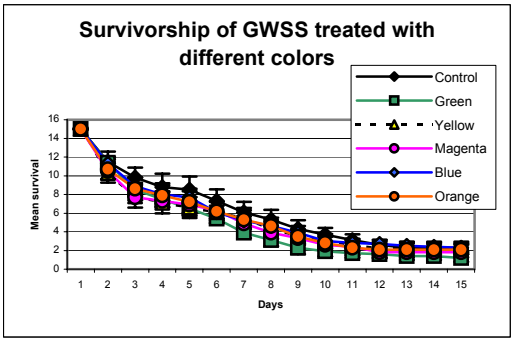

Figure 2. Mean survival of adult GWSS with standard error bars. Insects were collected during January.

Both marked and unmarked control insects released in a barren field were equally able to fly at least 100 meters from the release point within the first five minutes of their release. This field experiment (Figure 3) showed that the drop in recapture

over distance did not differ between marked and unmarked insects. Also, the slope of the line describing the relationship between the numbers of GWSS adults recaptured versus distance did not differ between the marked and unmarked individuals. The barren field experiment also showed a clear-cut affect due to wind speed. At wind speeds above 5 m/s, the efficiency of the yellow sticky cards to capture adult GWSS suddenly dropped (Figure 4) suggesting that the insects cannot steer into the traps or they are simply blown away.

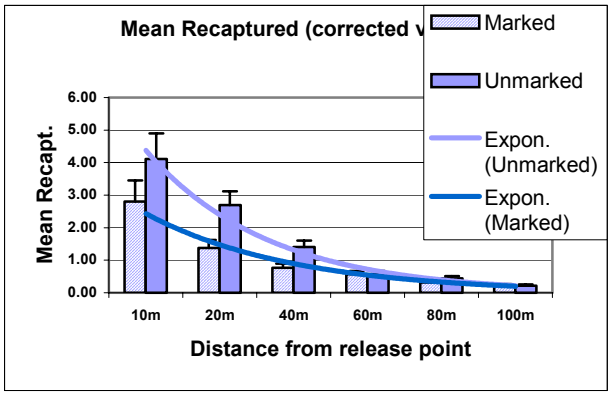

Figure 3. Mean recapture of marked and control insects. Standard error bars and trend lines shown.

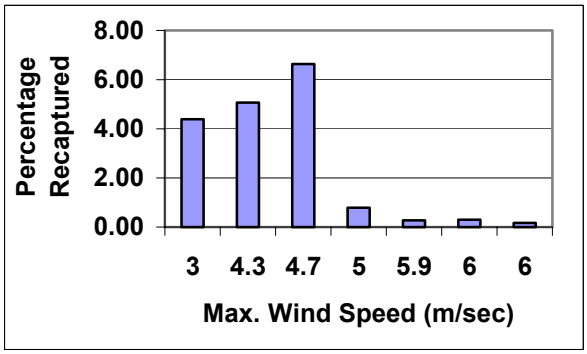

Figure 4. Mean recapture of GWSS with increasing wind speeds.

We now have focused on sampling adult and nymphal GWSS in citrus to estimate changes in their densities over time on a whole tree basis. We began sampling GWSS weekly at the Citrus Experiment Station, Agricultural Operations (UCR) 19 October 2001 and sampled three randomly selected trees per week. We alternated sampling the lemon trees and Valencia trees biweekly using two parachutes to cover each sample tree and confine the Pyronyl Crop Spray® (a natural pyrethrum product). We used the spray to fog the tree canopy beneath the parachute tent. On May 17, 2002 we initiated sampling at a new site in Kern County east of Bakersfield after obtaining authorization to apply pyrethrum in Kern County. The sites we had previously sampled in the Bena Road area beginning in July 2001 were treated October 2001, consequently the GWSS populations at these sites were too sparse to estimate GWSS densities, age structure and survival during the winter spring 2001-2002 period. Adult GWSS densities were too low at both the Agricultural Operations and Kern County sites to track their movements during winter and spring. By fogging Valencia and Lemons trees at Agricultural Operations, UCR, and navel orange trees at a Kern Count grove in 2002, we estimated adult GWSS densities, their sex ratios, the onset of oviposition, and nymphal development. During the last months of this project, we are developing methods of detecting the presence of GWSS in riparian vegetation and, once detected, to estimate their densities, objectives three and four. We propose to test a system based on coated paper that will allow us to detect the ammonia in GWSS excreta and to test it against known GWSS densities. We are currently analyzing the data from these studies statistically and preparing manuscript based on these analyses.

FUNDING AGENCIES
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