

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

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INTRODUCTION

The glassy-winged sharpshooter (GWSS), *Homalodisca coagulata* (Say) (Homoptera: Cicadellidae) is an exotic insect in California, likely introduced from southeastern United States in the late 1980's. In California, it reportedly feeds on 73 plant species in 35 families and has the ability to spread *Xylella fastidiosa*, plant-pathogenic bacteria with differing pathovars each of which infects one or more economically important plant species. GWSS vectors Pierce's disease (in grapevines), phony peach disease, almond leaf scorch and oleander leaf scorch. Moreover, the vector is very mobile and occurs throughout the year; thus, to understand the epidemiology of these diseases, it is crucial that we are able to track GWSS' movements among its various hosts. To accomplish this end, we have developed a mark-recapture technique to track field movements of adult GWSS using fluorescent colored dust as a marker. Greenhouse trials show no significant difference in mortality and longevity of marked versus unmarked (=control) adults. We also monitored spatial movements of adult GWSS in 1) a citrus grove east of Bakersfield, California, 2) between a citrus grove and adjacent vineyards east of Bakersfield, California, 3) in a barren field in southern California and 4) in a lemon/Valencia orange grove interface on the Citrus Experiment Station at UC Riverside.

OBJECTIVES:

1. Develop a technique for marking adult glassy-winged sharpshooters rapidly and for releasing and recapturing them.
2. Develop a sampling system for glassy-winged sharpshooters eggs and monitor sharpshooter egg density initially on citrus.
3. Monitor field movements of adult glassy-winged sharpshooters.

RESULTS AND CONCLUSIONS

The use of several colors of dust to mark GWSS has proven to be a reliable and cost effective technique. In greenhouse studies, mortality was unaffected by the marking technique. No differences in mortality between marked and control insects were observed over a 60-day period. In the field, we recovered insects with recognizable marking 28 days after release. We concluded that this method could be used to mark and track GWSS field movements.

We conducted an experiment to track adult GWSS movements within a non-chemically treated citrus grove in the Bena Road area, near Bakersfield, Kern County. Weekly, from June through August 2001, we marked and released adult GWSS into a grove from which they were initially captured. A different colored marker was used each week to identify the date on which a GWSS had been released. A total of 44 yellow sticky traps were placed at increasing distances around the release point in the grove and the total number of GWSS and the number of recaptured (marked) GWSS on the traps were counted weekly. Over the course of the experiment, a total of 3,050 insects were marked. We recaptured 40 marked individuals out of the 10,311 GWSS captured on the sticky traps (1.3% of total GWSS marked). None of the marked insects was recaptured more than 40 meters from the release point.

In a choice experiment to determine GWSS' preference for Valencia versus lemon, we released marked insects in the interface between a lemon and a Valencia orange grove. Between July and August 2001, we marked a total of 8,330 adult GWSS with different colors of florescent dust each week. A total of 120 yellow sticky traps were placed on all the trees surrounding the release point up to 40 meters distance from the point. Preliminary results from this experiment suggest that, in the absence of disturbance, most adult GWSS do not move over long distances.

A barren field experiment was designed to test the dispersal behavior of marked versus unmarked adult GWSS in the absence of suitable host plants. We placed a total of 107 yellow sticky traps in concentric circles with each trap placed at 17 meters equidistant from the two adjacent traps on that circle. The concentric circles were 10, 20, 40, 60, 80 and 100 meters distance from the release point. Between July and September 2001, we released a total of 20,350 adult GWSS, half of which were marked with florescent dust. Traps were checked 24 hours after each release and every adult GWSS was counted. We recover a total of 327 insects (1.61% of the total released). Our results show that marked individuals are equally likely to be captured as unmarked individuals and that adult GWSS are able to fly at least the 100 meters over which the traps were placed in the absence host plants within the first hour of release.