

**EFFECTS OF PLANT WATER STRESS AND TEMPERATURE ON GLASSY-WINGED SHARPSHOOTER  
FEEDING IN RELATION TO TRANSMISSION OF *XYLELLA FASTIDIOSA***

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**ABSTRACT**

The glassy-winged sharpshooter (GWSS), *Homalodisca vitripennis* (Germar), is an economically important pest of grapevine, stone fruits, nursery trees, and ornamental plants in California because it transmits *Xylella fastidiosa* (Xf). Two related studies examined whether GWSS feeding behaviors that control Xf acquisition and inoculation are affected by environmental stresses such as plant water stress, cold ambient temperature, and diel light conditions. Both studies monitored feeding via electrical penetration graph (EPG). Effects of ambient air temperatures and light intensities on GWSS feeding on *Euonymus japonica* plants were studied outdoors (in Bakersfield, CA; a certified infested, non-agricultural area) during early spring. Effects of plant water stress were studied indoors, comparing feeding on well-watered vs. water-stressed citrus under high-pressure sodium vapor lamps. For both studies, EPG waveforms representing pathway phase (searching for xylem), X waves (xylem contact, likely to control Xf inoculation), and waveform C (ingestion of xylem fluid, Xf acquisition) were analyzed. Results showed no significant differences in feeding duration on *Euonymus japonica* for daylight vs. nighttime light intensities. However, xylem-sap ingestion occurred for significantly longer duration when ambient temperatures were higher than 10°C, and only occurred at temperatures below 10°C when ingestion was continued from a preceding, warmer period. Xylem-sap ingestion also was longer on well-watered than water-stressed citrus plants. Frequencies of X waves were higher, both at high temperatures and when plants were well-watered. Thus, both acquisition and inoculation behaviors are increased during warm air temperatures and when plants are well-watered.

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