Statewide Distribution and Abundance of Putative Insect Vectors of Pierce's Disease of Grape

Danny McDonald, Isabelle Lauziere, Forrest Mitchell

Texas Agricultural Experiment Station, Texas A&M University, 1229 North Highway 281 Stephenville, TX 76401

Introduction

Yellow sticky trap samples have been collected from central and north-central Texas vineyards since 2003. In collaboration with USDA-APHIS, this effort was expanded to statewide collections in 2005. Xylem feeding Auchenorrhyncha were identified and counted on these traps. Results are summarized and the density of *Homalodisca coagulata*, the glassy-winged sharpshooter, is displayed in different geographical regions in Texas. *Graphocephala versuta* and *Clastoptera xanthocephala*, two other common xylem feeders, are also identified and densities plotted. Preliminary evidence indicates consistent annual increases in the number of *H. coagulata* during the course of the growing season in both central and north-central Texas.

Groups Sampled

Yellow- Far West Texas
Brown- West Texas
Green- Panhandle
Pink- Christoval
Orange- Val Verde
Blue- Wichita Falls
Light Blue- North Texas
Grey- Central Texas
Fuchsia- East Texas
Red- No Vineyards Sampled

Homalodisca coagulata

Graphocephala versuta

Clastoptera xanthocephala

Cuerna costalis

Draeculacephala navicula

Homalodisca insolita

Table of Hoppers Counted

	2003	2004	2005
Homalodisca coagulata	1689	3288	9767
Graphocephala versuta	71	585	1551
Clastoptera	467	535	833
Other Xylem Feeders	99	294	385
Number of Traps Examined	2267	2431	6192
Number of Vineyards	9	9	45

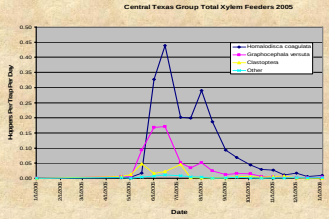
Methods

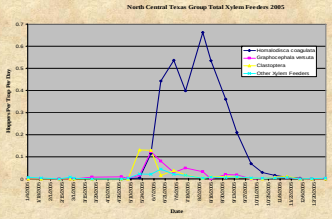
Yellow sticky traps were sampled in either weekly or biweekly intervals from 2003 to 2005. Each trap was visually examined for xylem feeders and individual species were counted separately. The data were entered into a spreadsheet by year. Within each spreadsheet the traps were separated by the vineyard where they were collected, by the date they were placed in the field and by the date they were removed. Vineyards in similar geographic locations were sorted into nine different groups, with a tenth group (south Texas) identified where no vineyards were found to survey. Graphs were developed to depict the population fluctuations of different xylem feeding insects throughout the year. Each graph illustrates a certain species of xylem feeder or all xylem feeders broken down to how many were caught per trap and then per day according to how many days the traps were left out. This scaling by insects per trap per day allows comparison between the lines on the various graphs.

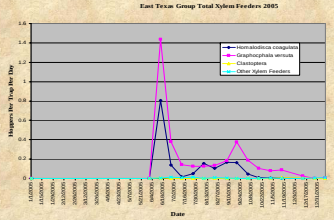
Yellow Sticky Traps

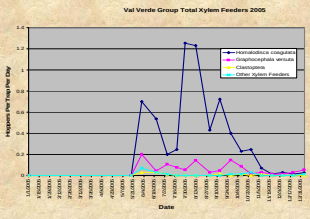
Pierce's Disease Symptoms on Grape Canes

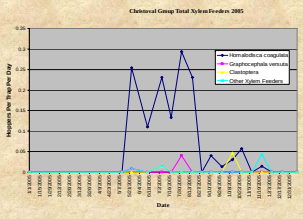
http://ceriverside.ucdavis.edu/Viticulture/

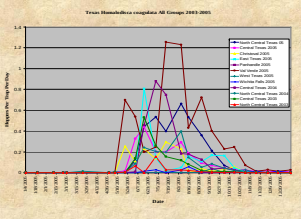


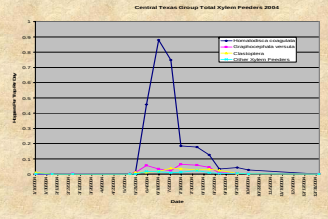


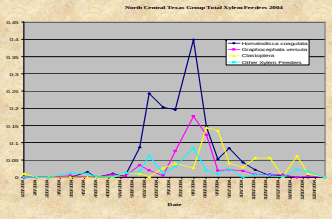


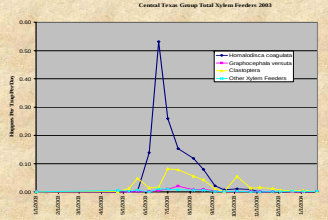


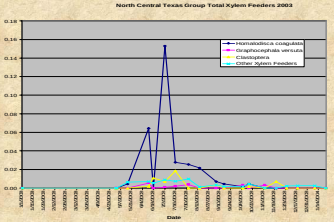












Results and Discussion

The glassy-winged sharpshooter is recognized as the most serious vector of Pierce's disease in the United States. It's relatively large size and stout beak allow it to feed through thick bark and other hard tissue of a number of plant species. The accidental importation of this species into California resulted in a serious epidemic of Pierce's disease in the southern portion of the grape growing region, but the northern region also is at risk. Endemic to Texas and the gulf coast states, *H. coagulata* is also viewed as a serious pest in its capacity as an efficient vector of *Xylella fastidiosa*. Combined with an apparently high vagility, this pest is viewed as being mainly responsible for the limitation of wine and grape crops in the eastern half of the state.

Over the three year vineyard survey it is clear that the population of *H. coagulata* has increased steadily in the north central Texas region. It likely increased in the vineyards surveyed in central Texas as well, but the number of vineyards in this region increased from 6 to 28 in 2005 and thus diluted the results. All regions besides these two have data only from 2005. Within a year, the *H. coagulata* population normally develops two peaks in the vineyard. The first peak initiates in June and the second in August. Whether these are generational peaks or whether it is a reflection of immigration is currently unknown. Several vineyards in the central Texas area also have traps placed outside the growing area that indicate that at least the first peak is due to immigration (data not shown).

In this study, the highest concentration of *H. coagulata* came from the Val Verde region, While the East Texas region proved to be the most abundant in blue-green sharpshooters, *Graphocephala versuta*. *Clastoptera xanthocephala*, a spittlebug in the newly created family Clastopteridae, and other xylem feeding insects, while perhaps important as xylem feeders and therefore possible vectors of *Xylella fastidiosa*, are not found in high concentrations in any of the groups surveyed in Texas. The Panhandle, West Texas, and Far West Texas groups had very few xylem feeding insects and only eighteen *H. coagulata* between them, 94% of which came from the West Texas area. More Vineyards are being added to the study as we continue to survey throughout 2006.