

2004 Report to the SERA-IEG 14 Annual Meeting

Texas Pierce's Disease Program

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PIERCE'S DISEASE RESEARCH IN TEXAS A WISE INVESTMENT FOR THE FUTURE OF GRAPE GROWING

The introduction of Glassy-winged Sharpshooter (GWSS), *Homalodiscus coagulata*, into California has drastically changed the rate at which Pierce's disease, *Xylella fastidiosa*, can move throughout that state. Not only has this changed the dynamics of intrastate movement, but the epidemiology of the disease within the vineyards as well. The presence of GWSS presents a new challenge in managing this vector compared to the established methods of managing indigenous vectors of PD. Glassy-winged sharpshooters are more robust than indigenous vectors in much of the grape growing areas of California and the current edge effect associated with PD will become a vineyard effect with the establishment of this insect. Recent comparisons of GWSS genetics show that Texas is the origin of the population that has established itself in the southern half of California. It is the position of the Texas Pierce's Disease Task Force that by better understanding the biology of GWSS in its native environment, weaknesses may be discovered that would provide vital control strategies.

One striking difference in GWSS behavior is that in California, the insect can be readily found feeding on warm winter days while in central Texas, the insect is almost entirely absent from late fall through late spring. Understanding this migratory or diapausal behavior may provide insight as to what degree the insect can establish itself in different climates. It is also notable that in many north and central Texas vineyard locations, GWSS is only found in relatively low numbers. Preliminary observations of GWSS egg masses show a high degree of parasitism which suggests there may be parasitoids adapted to these environments that would enhance the current proposed long-term sustainable strategy in California. It is also believed that mycopathogens may play a large role in suppressing GWSS populations in their native range. In California, gains have been made in managing GWSS populations in agricultural settings utilizing a

chemical-based strategy, but insect control in urban areas remains a challenge. These areas are rapidly expanding as urban encroachment moves into the world renowned wine producing areas in California and the current management strategy utilizing pesticides will be continuously challenged.

Similar challenges are associated with the plant nurseries shipping commodities out of the southern areas of California where GWSS populations remain a serious challenge. The enormous costs associated with inspections and treatments of this commodity prior to intra-state movement could be reduced utilizing a more long-term sustainable strategy with natural enemies. Identification, rearing and release of these biological control agents may greatly assist in managing GWSS populations where chemical inputs are problematic.

Insect surveys across Texas have identified other large xylem feeding sharpshooters that reside in the riparian/vineyard interface. *Paraulacizes irrorata* and more than one *Oncometopia* species also appear to be important in the movement of *X. fastidiosa* in east and north Texas. These insects are also strong fliers and represent a similar threat in the vectoring of PD as does GWSS. Furthermore, early 2004 insect surveys in the Hill Country vineyards are indicating the presence of other xylem feeders. Species of *Graphocephala* are consistently caught on traps throughout this area, as well as a few *Cuerna costalis*, and *Draeculacephala* sp. Studying the behavior of these insects and their role in disease spread in Texas may prove vital should these species be introduced into California at some later date.

Perhaps the greatest potential for knowledge gain in Pierce's disease lies in understanding the disease complex in the areas of the northern Hill Country of Texas. As one travels north of Fredericksburg, soil types change from calcitic-based to granitic soils. In these granitic areas, GWSS can be readily found in all vineyards, but the disease is not present. Preliminary screening of native, supplemental hosts shows that known sources of the bacterium also appear to be *Xylella*-free. In an area where the disease and the primary vector are native, this anomaly could provide to overall disease management.

Pierce's disease research in Texas not only provides Texas growers with increased knowledge vital for disease prevention and management, but could clearly provide important management tools that have nation-wide impact.