Texas Cooperative Extension
TEXAS PD NOTES

MAY 15, 2006 VOLUME 2, ISSUE 3

PD Symposium Scheduled for May 23rd at Flat Creek

The 3rd Annual Texas PD Research Symposium is scheduled for Tuesday, May 23rd at Flat Creek Estates near Lago Vista. This educational event represents the single greatest opportunity growers have to hear the latest experimental findings and interact with the PD research team.

Pierce's disease is not a problem that can be sprayed away nor is a cure on the immediate horizon. Growers with grape plantings in areas at risk to Pierce's disease need to understand the dynamics of the pathogen, which plants support the bacterium in the native environment, what insects serve as vectors, how these insects behave and finally what growers can do to break the disease cycle.

This year's symposium was planned with the input of your Texas PD Grower Advisory Board. In addition to offering input on research project prioritization and funding, this group provides programmatic advice for grower educational events. By adding this element of grower-oriented practicality, your PD research team is being asked to gear their presentations in a way to provide insight as to how best manage this limiting disease. Other educational venues and conferences frequently offer PD overview presentations, but if you want the latest and most detailed information, this conference is a must.

Conference registration fee is $20 which includes lunch. Registration forms, the agenda and directions are posted on the Texas Winegrower Listserver. To receive a faxed copy of these forms or for more information, contact Becky at the Gillespie County Extension office @ 830.997.7047

Morning Agenda

9:00 - The Texas PD Vectors; Their Range and Seasonality- Forrest Mitchell

9:45- APHIS PD Database Update- Bobby Guerra

10:30- Understanding Why Pierce's Disease Occurs Where it Does– Mark Black

11:15- An Overview of the California & National PD Initiative– Beth Stone-Smith

12:00- Catered Lunch

Afternoon Agenda

1:30- Know Thy Enemy: Microbiology, Genetics and Plant Response to *Xylella fastidiosa*– Lisa Morano

2:15- Texas Vineyard Survey & Global Information Systems– Jacy Lewis

3:00- Imidicloprid Application Technology– Bayer Crop Sciences Rep.

3:45- Epidemiology of PD in Texas Vineyards– Thoughts on Practical Management Strategies- David Appel

4:30- Question & Answer Session

4:45- 6:00- Reception & Wine Tasting

TEXAS PD NOTES IS PRODUCED AND EDITED BY

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- Ed Hellman, Extension Viticulturist, Lubbock, TX
- Jim Kamas, Extension Fruit Specialist, Fredericksburg, TX

Additional Articles Contributed by Members of the Texas Pierce's Disease Task Force

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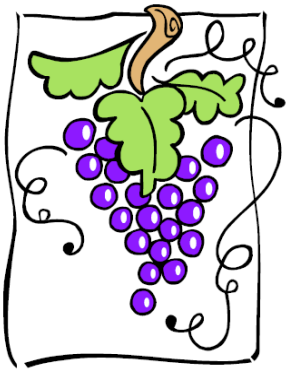
Texas Pierce's Disease Research & Education Program
Annual Report of Activity
April 2005– March 2006



The Texas Pierce's Disease Research and Education Program is a collaboration, cooperation, and interaction among the Texas Agricultural Experiment Station (TAES), Texas Cooperative Extension (TCE), Texas A&M University (TAMU), Texas Tech University, the University of Houston–Downtown, the University of Texas at Tyler, the USDA Animal and Plant Health Inspection Service (APHIS), The Texas Department of Agriculture, and the grape growers, wine producers, and citizens of Texas. Programmatically the research and education effort is divided into four components, which are to: (1) develop and implement a statewide monitoring system for the detection and movement of the disease and its insect vectors, (2) conduct fundamental and translational research that leads to the timely development of effective and economical Pierce's Disease management, (3) provide research-based, quality, and relevant education to grape growers, wine producers, and other interested individuals, and (4) provide for the infrastructure necessary to advance research excellence. During the 2005-06 budget cycle, the program dispensed $1.113 million for research and education programs, of which $161,500 was deferred for capital improvements. Creation of a new, pervasive, and enduring infrastructure development plan postponed installation of capital improvements associated with the program; there are many notable highlights that include:

Expanded surveys in terms of geography of biota sampled to characterize "Low PD Risk" vineyards as those where certain weed species are absent. These include the weeds *Ambrosia trifida* (giant ragweed) and/or *Helianthus annuus* (common sunflower). Genetic analysis confirmed the ability of *A. trifida* to harbor the grape strain of the disease-causing bacterium, *Xylella fastidiosa*. Several native plants including Yaupon holly has also been shown to be reservoirs for *X. fastidiosa*. Management practices are needed in reducing encroachment of one or more of these plant species along rights-of-way, seasonal riparian habitats, and farmlands.

From a vineyard study conducted within a high disease pressure zone, hybrid varieties were shown to become infected with significant *X. fastidiosa* levels implicating a mechanism of bacterial tolerance rather than resistance. Black Spanish and Blanc du Bois appear to have very low bacterial levels and no loss of yield or vigor over time suggesting they are excellent options in areas of high PD pressure. At this particular vineyard the variety Cynthiana harbored very high bacterial levels and had declining yields. This study suggests that it may be a mistake for growers to consider planting hybrids in or near their *V. vinifera* vineyards. Hybrids may harbor high bacterial levels and lead to faster disease spread within their vineyard.

Use of Quantitative Real Time Polymerase Chain Reaction demonstrated all three of the most common xylem feeding insects (*Homalodisca coagulata* - the glassy-winged sharpshooter, *Graphocephala versuta* – the peach leafhopper, and *Clastoptera* species – a spittlebug) collected as part of a statewide survey scored positive for the occurrence of *Xylella* bacteria. Detailed analyses of the bacteria carried by *G. versuta* indicated that this species is not carrying a grape strain of Pierce's Disease, but rather a strain more related to an east coast tree and to an ornamental strain. The other two positive species however, were carrying a Pierce's Disease strain of the bacterium. Initial investigation has also demonstrated that early season glassy winged sharpshooters are not carrying *Xylella*, while late season populations present as much as 80% positive reactions.

Studies examining the relationship between soil type and the susceptibility of grape variety to Pierce's Disease preliminarily demonstrated the overall condition of grape vines to be poorest in high pH clay soils, intermediate in granite sands, and best in a peat-based mix. Validation of these results will assist growers in utilization of vineyard site planning as a method in reducing the risk of obtaining or expressing symptoms of Pierce's Disease. Epidemiological studies illustrated the spread of Pierce's Disease within vineyards to be faster along rows rather than across rows and the presence of an edge effect does not appear to be consistent; the occurrence of a complex series of patterns for susceptible, tolerant, and resistant varieties, but the mixing of susceptible varieties with resistant varieties appeared to accelerate disease progress; and disease progress rates varied for the same varieties at different are used in advising experienced, new and prospective growers on the best approach to mitigating the risk of Pierce's disease. A variety of educational methods are utilized to share information with growers and the research community that include, peer-reviewed publications, presentations at research symposia and commodity group meetings, grower field days, publication of the semi-monthly newsletter *PD Notes*, which highlights results of applied research conducted in Texas, and maintenance of the Texas Pierce's Disease Research and Education Program website **(http://piercesdisease.tamu.edu)**

THIS REPORT WAS COMPILED BY TIM DAVIS, DENNIS GROSS, AND KEVIN HEINZ AS MEMBERS OF THE TEXAS PIERCE'S DISEASE RESEARCH AND EDUCATION PROGRAM EXECUTIVE TEAM.

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Texas PD Notes

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Difference in Sap Flow Among Infected Grape Varieties—*Lisa Morano*

Hybrid grape varieties such as 'Blanc du Bois' have been bred for disease resistance including resistance to Pierce's disease (PD). Our previous evaluation of 'Blanc du Bois' within a vineyard suggested that this hybrid was harboring bacteria and yet not failing due to the disease. It has also been noted by field observation that all *Vitis vinifera* varieties do not respond equally to PD infection. Varieties such as 'Chardonnay' reportedly fail more swiftly than others such as 'Cabernet Sauvignon'. We wanted to know whether differences in susceptibility could be directly correlated to a reduction in sap flow or if some other biochemical mechanism was responsible for the differences observed.

Using Dynamax sap flow monitors, we measured xylem flow 15 weeks post infection on both inoculated and control vines. Measuring average sap movement over one day for three replicate vines of each of the three varieties showed that 'Chardonnay' had the most dramatic drop in sap flow after infection. 'Cabernet Sauvignon' also showed a reduction in flow with infection, but it was less dramatic. There was large variability in 'Blanc du Bois' vines, but interestingly the mean flow for infected and control vines was similar. The most severe disease symptoms corresponded with the greatest reduction in flow. However, bacterial levels (using ELISA) did not correlate with most severe symptoms or flow rate.

It seems likely that the plant response to the infection (formation of tylose growths to wall off the infection) or some feature of the plant anatomy is more critical than simply the presence of high bacterial levels. The inoculation study by Kamas, Black and Stevenson to be initiated this year will include cross section analysis of xylem vessels during the course of infection for a variety of native Texas *Vitis spp.* and *V. vinifera* varieties. This may further elucidate what mechanism or mechanisms are responsible for disease tolerance.

MORANO'S LAB SOUGHT TO INVESTIGATE THE CORRELATION BETWEEN XYLEM FLOW AND VARIETAL SUSCEPTIBILITY TO PIERCE'S DISEASE