

Highlights and Impacts of October 2005 – December 2006 Projects Funded by the Texas Pierce’s Disease Research and Education Project

Project Investigators: Forrest Mitchell and Blake Bextine

Project Title: Entomology Research on Pierce’s Disease of Grape in Texas.

Significant Accomplishment	Impact on Texas Pierce’s Disease Management
1 Analysis of GWSS from sticky traps via real time PCR (QRT PCR) has demonstrated a late season contamination rate of the hoppers by the <i>Xylella</i> bacterium of 65%. Verification of results is in progress and subsequent sequencing of the amplicons will ensue in order to determine <i>Xylella</i> strains present in the GWSS. Similar work on <i>Clastoptera</i> and <i>Graphocephala</i> leafhopper species is proceeding.	Incorporation of molecular protocols into leafhopper sampling increases the power of the sampling in order to direct management practices to those insect populations most important to the growers. Uncontaminated hoppers will not likely transmit the bacterium, nor will hoppers contaminated with the wrong strains.
2. Analysis of GWSS from 2003 sticky traps via QRT PCR demonstrated the ability to detect <i>Xylella</i> in insects stored at 4°C for up to two years. These analysis also indicated that the 2003 populations of hoppers were more likely to harbor <i>Xylella</i> early in the season (0%) compared to hoppers at the end of the season (70%).	We can analyze the backlog of samples from the past three seasons to determine where and when hoppers contained <i>Xylella</i> . This will help develop the scientific basis for understanding the epidemiology of the disease in Texas.
3. Verification of trapping data from 2003-2004. Traps have been counted previously, but in 2003 we did not know the spectrum of leafhoppers we would encounter and in 2004 we did not count <i>Clastoptera xanthocephala</i> . All 2004 traps have been reexamined and most 2003 traps are finished.	This makes our data uniform across the history of the project and allows for a better assessment of vector seasonality. Further, we are now able to pinpoint samples for removal and analysis in the same context we use for current samples.
4. In October, 922 traps were received, processed and scored. In November, 856 traps were received processed and scored. In December, 678 traps were received, processed and scored. Year to date, 7002 traps have been received, processed and scored.	These traps represent collection efforts around the state. The data from them will be valuable to evaluating the risk of PD in vineyards due to the presence of known insect vectors. <i>Homalodisca coagulata</i> is now present in most of the state, but not yet common at the fringes of its range.
5. The dataset of collected traps has been provided to USDA-APHIS for use in developing the alpha-test of the statewide database.	Development of this database will provide current information to project participants and growers whose fields are sampled. It will be an extremely valuable tool in tying together research from across disciplines and in keeping all interested parties current on results.
Source and Amount of Funds Leveraging Current Pierces Disease Project:	
1. (Bextine) University of Texas STARS award for equipment startup. \$305,000. Compiled a molecular suite that includes DNA sequencing and QRT PCR capabilities.	
2. (Bextine) University of Texas, Tyler Equipment Grant. \$22,000. 2D Protein Gel Separation	

Equipment. [Dr. Cliff Boucher (UTT) – Co-PI]

3. (Bextine) CDFA money was approved and arrived in Dec. 2005. \$27,000. Quantification of Xf transmission by GWSS. [M.J. Blua (UCR) and T.A. Miller (UCR) – Co-PI's]

4. (Mitchell) PUF fund award by Texas Agricultural Experiment Station. \$20,000. Funds to be matched by TAES-Stephenville resources (\$30,000) for purchase of a real-time PCR unit.

5. (Mitchell, Lauzière, Bextine) Research into *Xylella*-induced disease of potato. Industry funds are verbally committed, allocation is pending.

Publications/Presentations Documenting Research/Education Outputs (please provide full citations for publications; and the title, audience, location, and date of each presentation):

1. **Bextine, B.R.**, B.C. Jackson, D.B. Harshman, & T.A. Miller. 2005. *Homalodisca coagulata* feeding posture. *Ann. Entomol. Soc. Am.* 98:814-819.
2. Oral Presentation, December 1, 2005 to USDA-APHIS, Edinburg, Tx. "The GWSS/Xf interface".