Propagation Success of Grapevines Infected with *Xylella fastidiosa*

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Pierce's Disease (PD) of grapes, caused by the xylem limiting bacterium *Xylella fastidiosa*, is typically fatal to varieties of *Vitis vinifera*. Pierce's Disease is commonly vectored by xylem-feeding insects, including the glassy-winged sharpshooter, but other vectors may also spread the disease. One recent report documented the successful transmission of *X. fastidiosa* with pruning shears (Rayda, et al., 2007). In addition, Meyer et al. (2002) report graft transmission of *X. fastidiosa* may also be possible. Conventional wisdom assumes because PD is fatal to grapevines, cuttings taken from *X. fastidiosa* infected grapevines would not survive the asexual propagation process, and therefore would not be able to produce a marketable plant. However, it seems likely cuttings taken from *X. fastidiosa* infected vines would root, but the success and survival of cuttings taken from *X. fastidiosa* infected grapevines has not been reported. The objective of this experiment was to investigate rooting success of asexually propagated cuttings taken from *X. fastidiosa* infected grapevines and determine if rooted cuttings can survive and produce viable plants for vineyard establishment.

Cuttings were taken January 2008 from dormant *Vitis vinifera* cv. Merlot and cv. Cabernet Sauvignon grapevines. Vineyards which provided propagation wood were located in the Hill Country and Gulf Coast regions of Eastern Texas where PD is problematic. Over several previous growing season grapevines were determined to be asymptomatic or symptomatic for PD symptoms (David Appel, personal communication). Prior to our research, symptoms of PD were recorded on each grapevine in each vineyard and given a rating on a scale from 1-6 (1 being asymptomatic and 6 being highly symptomatic). Asymptomatic cuttings were taken only from grapevines with a 1 rating, while symptomatic cuttings were taken from grapevines with ratings ranging from 3 to 5 (grapevines with a rating of 6 died and had been replaced). Prior to taking cuttings, all pruning instruments were spayed till drip with 70% isopropyl alcohol (Ryada, et al., 2007). Spurs and cuttings taken from each grapevine were labeled. Cuttings were transported on ice in coolers to Texas Tech University in Lubbock, Texas. Upon arrival, cuttings were transplanted into clear plastic tubs (119 x 57 x 61 cm) filled with a standard greenhouse medium and allowed to root under greenhouse conditions. A data logger recorded greenhouse climate data and medium soil temperature. During rooting daily observations of bud break were made. At the conclusion of six weeks cuttings were uprooted and evaluated. Rooting percentage, the number of roots, root length, root rating (0 = dead, 5 = more than 30 roots), the number of shoots, shoot length, and stem diameter were recorded for each cutting.

Rooting differences were found between grape varieties, vineyards, and PD symptomatic or asymptomatic grapevines. Asymptomatic Merlot vines from the Gulf Coast vineyard rooted at 67%. While symptomatic Merlot fines from the same vineyard had a rooting percentage of 26%. Cabernet Sauvignon vines from the Gulf Coast vineyard had rooting percentages of 48 and 70% (symptomatic and asymptomatic grapevines, respectively). For the Hill Country vineyard, Merlot symptomatic vines had a rooting percentage of 89%, while asymptomatic Merlot grapevines had a rooting percentage of 96%. Symptomatic Cabernet Sauvignon grapevines from the Hill Country rooted at a percentage of 93%, while asymptomatic Cabernet Sauvignon vines from had a rooting percentage of 90%. Other rooting and shoot data followed similar trends.

Our data indicate PD symptomatic grapevines have the ability to be propagated asexually through cuttings. Future work will test source vines and rooted cuttings with Quantitative-PCR and ELISA for the presence of *X. fastidiosa*. In addition, future research will be conducted to determine long term survivability and viability of cuttings taken from PD symptomatic grapevines.

References

Meyer, M., L. Kocisis, and A. Walker. 2002. Transmission of Pierce's Disease by chip-budding and bench-grafting. Am. J. Enol. Vitic. 53:248A.

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