

BIOLOGICAL CONTROL OF PIERCE'S DISEASE OF GRAPEVINE WITH BENIGN STRAINS OF *XYLELLA FASTIDIOSA* SUBSP. *PIERCEI*

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ABSTRACT

This project involves the evaluation of the biological control of Pierce's disease (PD) with a strain of *Xylella fastidiosa* (*Xf*) that is benign to grapevine. The benign strain, EB92-1, will be evaluated in two vineyards in Southern California/Temecula that are hotspots for PD and in two vineyards in the Napa Valley. Different methods of utilization of the biocontrol strain are also being evaluated, including using cuttings from mature vines that are infected with the EB92-1 strain, injection of plants in the vineyard compared with those injected prior to transplanting, and injection of the rootstock, scion, or both.

INTRODUCTION

Pierce's disease (PD) of grapevine is a chronic problem for the California grape industry and has become more of a threat to the industry with the introduction of the glassy-winged sharpshooter (GWSS). The only feasible control for PD is resistance. Through 10 years of research on the biological control of PD of grapevine in Florida by cross protection with weakly virulent strains of *Xylella fastidiosa* (*Xf*), we demonstrated that this also is a potential means of controlling this disease. The overall goal of this project is to develop a biological control system for PD of grapevine that would allow the production of *Vitis vinifera* (*V. vinifera*) in California and other areas where PD and GWSS are endemic.

OBJECTIVES

1. To evaluate strain EB92-1 of *Xf* subsp. *piercei* which has provided effective biocontrol of PD in previous greenhouse and vineyard tests in Florida for possible commercial application for the biological control of PD of grapevine in the vineyard in California.
2. To compare different methods of treatment with strain EB92-1 of *Xf* subsp. *piercei* for the biocontrol of PD in *V. vinifera* in the vineyard.

RESULTS

This project is being initiated. We are in the process of locating two test vineyards in the Temecula/Southern California area, where the PD is chronic and severe. We are also locating three test vineyards in the Napa Valley area. Plants for the test vineyards will be obtained this winter/early spring, injected with the biocontrol strain when new growth is two-three feet in length and transplanted into the vineyard in the spring of 2008.

Experiments to evaluate different methods of treatment with EB92-1 were established in the MREC vineyard in Apopka, Florida during the summer. Four treatments were applied to the cultivar Merlot/101-14 on May 29 and the plants were transplanted into the vineyard on June 21. The treatments were 1) injection of EB92-1 into the scion only, 2) injection of EB92-1 into the rootstock only, 3) injection of EB92-1 into both the rootstock and scion, and 4) nontreated. Five treatments were applied to the cultivar Chardonnay CL96/3309 on June 13 for the greenhouse treatments and on July 26 for the vineyard treatment. The plants were transplanted into the vineyard on July 3. The treatments were 1) injection of EB92-1 into the scion only in the greenhouse, 2) injection of EB92-1 into the rootstock only in the greenhouse, 3) injection of EB92-1 into both the rootstock and scion in the greenhouse, 4) nontreated, and 5) injection of EB92-1 into the scion only in the vineyard. In a third experiment, Chardonnay cuttings from the MREC vineyard were grafted onto Salt Creek rootstock rooted cutting from the vineyard. The grafted plants were transplanted into the vineyard on August 14. The treatments included 1) Chardonnay cuttings from mature vines that had been treated three years ago with EB92-1 on Salt Creek, 2) Chardonnay cuttings from mature nontreated vines on Salt Creek, and 3) Chardonnay cuttings from mature nontreated vines on Salt Creek, with the scion injected with EB92-1 in the vineyard on August 29.

CONCLUSIONS

The project was initiated in July. There are no conclusions to report.

REFERENCES

Hopkins, D.L. 2005. Biological control of Pierce's disease in the vineyard with strains of *Xylella fastidiosa* benign to grapevine. Plant Dis. 89:1348-1352.

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