

Advancing biopesticide technologies for managing Pierce’s disease 2022 field trial update

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Summary: The objective of this trial is to develop a range of efficacious biopesticides for commercial application against Pierce’s disease (PD). This project focuses on field testing of natural biological products for control of PD. Biological products are microbes that live in association with plants. Our research groups isolated biocontrols, both bacterial and bacteriophage-based, from agricultural samples, including grapevine wood. Bacteriophages are viruses that selectively infect and kill bacteria but do not infect plant or animal cells. This research aimed to generate the data needed for commercialization of new biopesticides that can be used by grape growers to manage PD.

Materials and Methods: Field trial testing were performed on 12 years old Cabernet Franc cultivar at Armstrong vineyard, UC Davis (Fig.1). The trial had total 10 treatments and each treatment was applied to ten grapevines with four shoots per grapevine. All biopesticides were delivered to the vine using Xyleject. An 80 µl dose of the biopesticide were injected at the base of each shoot (close to the spur position) on both sides of the shoot, following XylPhi-PD label recommendation. Biopesticides were injected to grapevine 1 day pre-Xf inoculation, and one-week post-Xf inoculation. Xf strain Stag’s Leap (approximately 1×10^7 CFU/ml) was used for disease positive to compare the efficacy of the treatments. The vines were inoculated with Xf using a drop puncture method of two 10µl doses between the second and third node of the shoot.

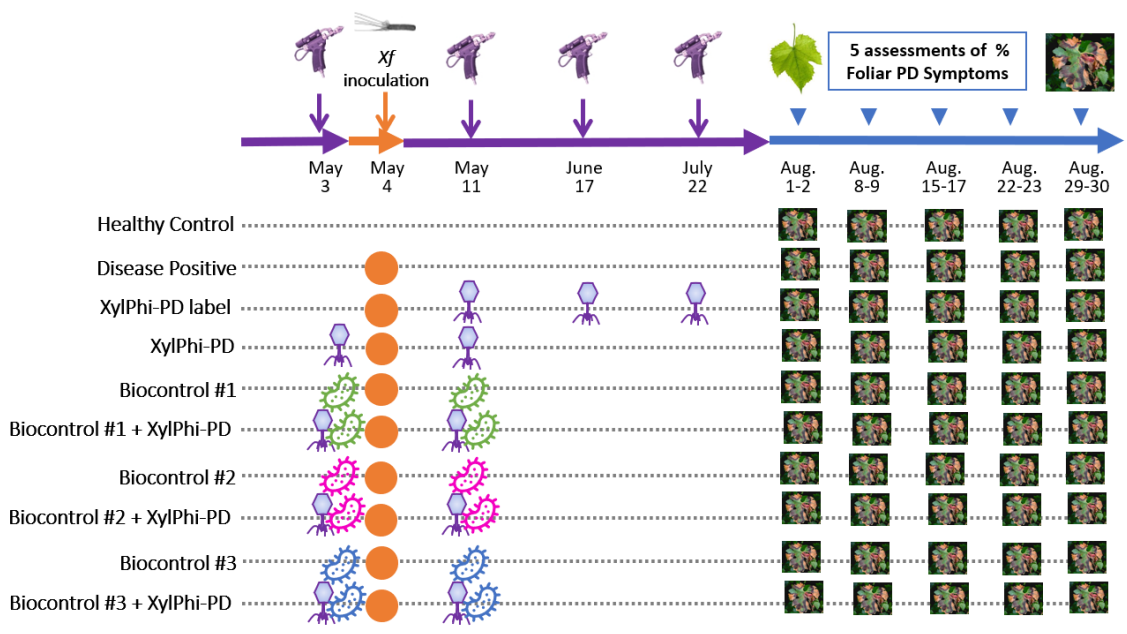


Fig.1 Experimental treatments, application and evaluation timelines.

Results:

- Vines treated with XylPhi-PD™ used as per label instructions show 50% fewer foliar symptoms than disease positive.
- XylPhi-PD™ and biocontrol agents #1, #2 and #3 performed better when combined.

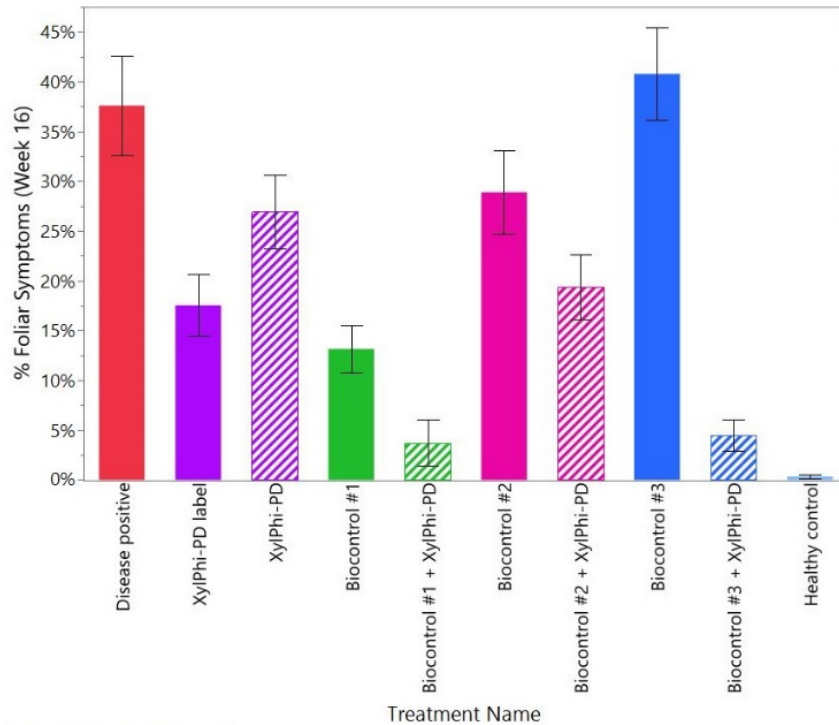


Fig.2 Efficacy of Biopesticides used individually and in combination with XylPhi-PD™

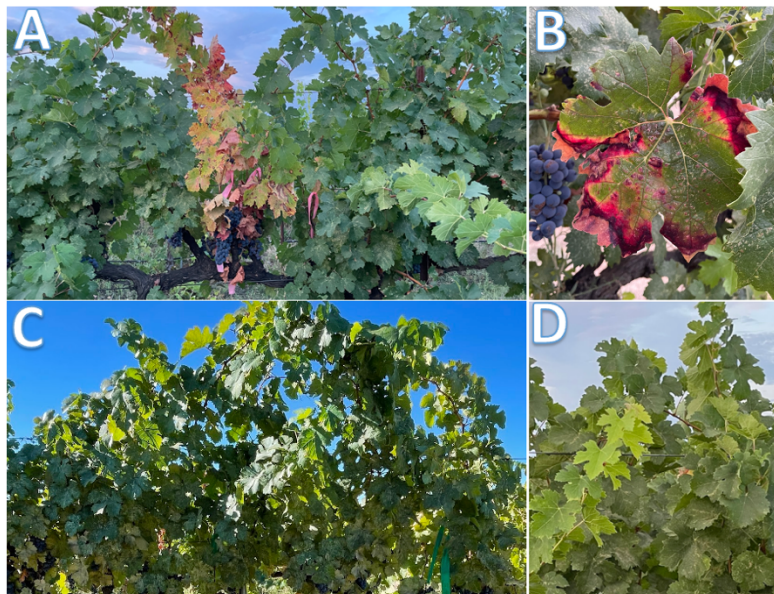


Fig.3 Disease positive vines (A and B) compared with treated vines with XylPhi-PD™ + biocontrol agents (C, D).

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