

BIOLOGICAL CONTROL OF GRAPE POWDERY MILDEW USING TYDEID MITES

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Summary

Uncinula necator, the causal agent of grape powdery mildew, is the most destructive pathogen of grapes worldwide, and is a particularly serious pest in the Northeastern US. There has been considerable interest, but limited success, in finding biological approaches to managing grape powdery mildew. Recently, we have discovered a mycophagous mite (*Orthotydeus lambi*) that is able to effectively suppress the development of powdery mildew on wild riverbank grape (*Vitis riparia*). However, can these mites provide biological control of powdery mildew in vineyard situations? The objective of this multi-year research project is to assess the relationship between grape species/cultivar, tydeid mite abundance, and incidence and severity of powdery mildew under a common vineyard setting. In our first season we successfully established, at the Geneva Experiment Station, over 700 rooted cuttings comprising 6 genotypes of *V. riparia*, 2 cultivars of *V. labrusca*, 3 cultivars of *V. vinifera*, and 4 *V. vinifera* interspecific hybrid cultivars. Vines were assigned to the following treatments: 1) receive *O. lambi* and no fungicides, 2) receive *O. lambi* and a fungicide active against powdery mildew, or 3) no *O. lambi* and no fungicides. *Orthotydeus lambi* became established on all grape species and genotypes with the maximum density per leaf of 26 found on the interspecific hybrid 'Seyval' and the lowest density per leaf of 3 found on Chardonnay. Overall, however, we did not detect any major differences in *O. lambi* numbers as a function of grape species. Mildew levels were only assessed for a subset of vines at the end of the season by estimating density of cleistothecia from a small sample of leaves. Vines that received *O. lambi* and no fungicide had slightly fewer cleistothecia, overall, than vines without mites and fungicide (6.7 vs. 8.3), although the difference was not significant. We anticipate that data collected in the second and third year of the study will allow us to better determine the effect of genotype on *O. lambi* density and their ability to regulate powdery mildew.

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