Control of powdery mildew by fungicides in grapes: results of 2006 trials

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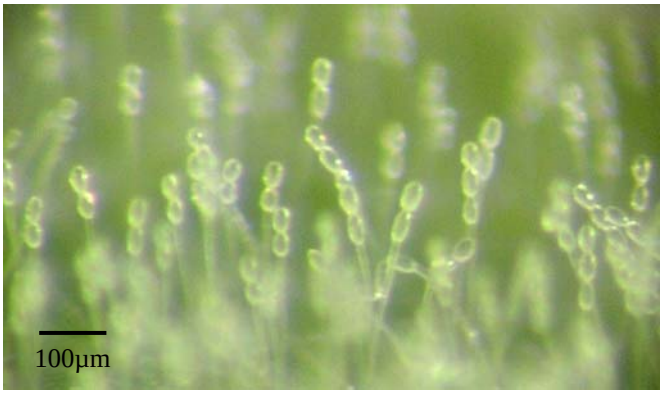

Powdery mildew conidia. Culture provided by P. Backup, UCD, image by C.N. Janousek.

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Contents

This report contains the results of four fungicide trials conducted at Herzog Ranch (Sacramento County, CA) during spring and summer of 2006. Trials tested the efficacy of various products in controlling powdery mildew (PM). The report contents are as follows:

0a. General research approach

Spraying commenced in early May 2006 and continued until 1 day before the field rating was begun on 25 July 2006. Four to 12 replicates (usually four) were established for each treatment in a randomized-block design within each trial. Vines were maintained by irrigation. Leaf removal and cane pruning occurred in mid-July. Quantitative assessment of fungicide efficacy was determined by estimates of powdery mildew severity in grape clusters in late July. Because of year to year variations in climate, powdery mildew disease intensity, and other effects, it is advised that these results be interpreted in the context of data collected from multiple sites and/or multiple growing seasons.

0b. Statistical methodology

Powdery mildew severity was assessed on up to 30 grape clusters within each replicate plot (plots consisted of 3 vines each) per treatment at veraison (late July 2006). Severity (defined as mean percent cover of disease on clusters) was determined for each plot, converted to proportions (0.0 to 1.0), and was then arc-sine transformed for statistical analysis. Incidence is not reported here. Two factor, type III ANOVAs (for the randomized block design) were performed with the SAS® 8.02 statistical package to determine treatment effects on disease severity in each trial. Pair-wise *a posteriori* Tukey-Kramer tests were used to look at differences in the mean PM cover of all treatment combinations within a single trial. $P<0.05$ was considered significant. Fungicide effects on fruit yield were examined in a small subset of plots in Trial 2 during late August 2006. Treatments differences were examined with a Type III ANOVA as above on untransformed data (kg fruit/vine).

0c. Result summaries

Trial 1. Control plots and 4 additional plots that received no fungicide application showed virtually 100% powdery mildew severity on grape clusters. Difenoconazole (at two concentrations), V-10118 (also at two concentrations), Pristine (with and without Latron B-1956 sticker), and BAS 56000F/Pristine all showed <4% powdery mildew severity. BAS 56000F and BAS 56000F/Sovran, Elexa 4%/Flint, Elexa 4%/Quintec, Quintec/Rally (at 14-21 days), and Foliar Supreme/Quintec also demonstrated good to fair reductions in PM.

Trial 2. Many of the products utilized in this trial conferred excellent to good control of PM, reducing disease severity to less than 10% whereas control plots showed virtually 100% disease severity. Quintec applied at 7-10 days was the top performing product. All DPX LEM 17 SC treatments of at least 3.8 fl oz/acre lowered PM severity to 1.1% or less, but were statistically indistinguishable from the plots that received the same product at 2.2 fl oz/acre (5.6% severity). USF 2010, Abound, an Endura/Sovran treatment, Elite alternated with Flint, Procure alternated with Flint, Flint alternated with Sonata ASO, and Quintec alternated with Sonata ASO showed good to excellent results. Procure alone showed 17% disease severity but this was due to coverage issues around late leafing. Finally, Eminent fungicide applied at 3.8 or 4.4 fl oz/acre showed about 22% PM cover, with disease severity reduced to <5% at 5.5 fl oz/acre.

Trial 3. Topguard was found to confer *excellent* to *good* protection at higher concentrations and/or shorter application intervals. When applied at 14 or 17 day intervals at lower concentrations, or in combination with Sovran, it was less effective. JMS Stylet Oil reduced PM relative to control plots but because of coverage, disease control was compromised. JMS Stylet Oil used in combination with Quintec reduced PM severity significantly more than when applied alone, probably as a result of the vapor action of Quintec. Pristine with Latron B-1956 (at 21-28 days) gave excellent results.

Trial 4. The treatments in trial 4 were initiated late in the season; the first fungicide applications were made on 27 May 2006. Disease onset occurred on May 3. Control plots, similar to those in other trials, contained 100% disease severity. Disease severity in Phyton-016-B (at 22 fl oz/acre) and product "A" plots was not significantly different from untreated vines. Milstop treatments (2.7 and 5.5 lb/acre at 7-10 days) conferred the best PM control and were significantly different from all other treatments. As this trial was started late in the growing season, we believe the disease was not fully controllable especially using soft chemistry products. This is a good example of the importance of the timing of the first application.

In general, disease control in 2006 was hampered by an overgrown canopy. Leaves were not removed until late in the season (i.e., a couple of weeks before veraison) and this resulted in leaf shingling thus interfering with product coverage. The systemic materials or those with vapor activity looked much stronger. In contrast, truly protectant products looked to be less effective, simply because coverage was an issue.

0d. Acknowledgements

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