GRAPE (*Vitis vinifera* 'Pinot Noir')
Powdery Mildew; *Erysiphe necator*

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Efficacy of fungicides for control of grape powdery mildew on Pinot Noir, 2009.

Fungicide treatments were arranged in a randomized complete block design in a block of 'Pinot Noir' (on *V. rupestris* x *V. riparia* 101-14 rootstock) planted in 1998 on a 7x8 ft spacing. A single buffer rootstock plant was trained between each set of treatment vines and a buffer rootstock row separated each varietal row. Pinot Noir vines were trained to a Guyot system on 4 to 5 Feb. Each treatment was replicated on 5 sets of 5 vines. Treatments were applied approximately every 14 days using a hooded boom sprayer at 150 psi for the first 2 applications, and 200 psi for the remaining applications. The rate of water used was 96 to 113 gal/A depending on amount of foliage present. Approximately 3.1 to 3.75 gal of spray suspension was used per 25 vines depending on time of year. Fungicides were applied on 28 May (EL 12), 10 Jun (EL 15), 25 Jun (EL 23), 8 Jul (EL 29), 22 Jul (EL 33), 5 Aug (EL 34) and 18 Aug (start of Veraison). A Rex Lime Sulfur application (1.89 gal/A, 4% solution) was applied to all dormant vines on 13 Mar using a hydraulic handgun sprayer at 60 PSI. Shoot thinning and sucker removal by hand occurred on 13 May. Canes were cut above the top wire on 26 Jun and maintained at this height throughout the growing season. A tank mix of Honcho Plus (2% solution) plus Diuron 4L (1.5 qt/A) was applied on 26 Mar for weed control. Rely (4 qt/A) was applied on 8 May for both sucker and additional weed control. No fertilizer was applied this year. No leaves were removed from the fruiting zone. According to the Gubler-Thomas powdery mildew forecasting model, there were 9 rain events between budbreak and end of bloom that were favorable for ascospore release and infection: 4 severe infection periods (1 and 13 May, 1 and 3 Jun), 4 moderate infection periods (4, 5, 6, and 7 May), and 1 low infection period (12 May). The risk index climbed above 60 on 22 Jun and remained high through out the summer (with only two days below 60) until mid Sep (Figure 1). Incidence and severity of powdery mildew on leaves were evaluated on 2 Jul, 14 Jul, 28 Jul, 10 Aug and 20 Aug. Incidence and severity of powdery mildew on clusters were evaluated on 3 Jul, 15 Jul, 29 Jul, 11 Aug and 20 Aug. Powdery mildew disease data was collected by randomly examining 50 leaves or clusters from the middle 3 vines of each replicate. Comparisons among treatments for severity of powdery mildew on leaves and clusters were evaluated by calculating the area under disease progress curves (AUDPC). AUDPC was calculated by multiplying the mean severity from two observation dates by the number of days between observations $(\Sigma[Y_{i+1} + Y_i)/2][X_{i+1}-X_i]$ where Y_i is severity of mildew at i*th* observation and X_i is the day of the i*th* observations). Values calculated between each pair of observations are added together to obtain a total AUDPC.

Spring weather conditions were typical for the area by the time grapes began to grow. Symptoms of powdery mildew were first found on 26 May and increased rapidly on nontreated vines. All fungicide treated vines had significantly less powdery mildew on leaves when compared to nontreated vines. PhD treated vines had significantly more leaves with powdery mildew but the overall severity was not significantly different from other fungicide treated vines. There was no significant difference in powdery mildew AUDPC for leaves among the various fungicide treatments. Incidence of powdery mildew on clusters was high for all vines, however, incidence of powdery mildew on clusters treated with PhD did not differ from nontreated clusters. Although all fungicide treated vines had significantly less powdery mildew severity on clusters or AUDPC than nontreated vines, PhD treated vines had significantly more powdery mildew severity on clusters or AUDPC than other fungicide treated vines. Three consecutive days of temperatures over 100 F occurred in late July resulting in some berry sunburn (dehydration) within clusters. This averaged 9.5% but was not different among the various treatments. No phytotoxicity was observed on any vines treated with any fungicide.

Treatment and Rate/A**	% Leaves with Powdery Mildew (20 Aug)*		AUDPC*	% Clusters with Powdery Mildew (20 Aug)*		AUDPC*
	Incidence	Severity	(Leaves)	Incidence	Severity	(Clusters)
Nontreated…….	100 a	45.0 a	15.4 a	100 a	100 a	39.5 a
Quintec at 4 fl oz plus Sylgard 309 at 0.03% V/V	6.0 c	0.1 b	0.0+ b	58.4 b	2.9 c	0.8 c
PhD at 6.2 oz plus Tactic at 8 fl oz/100 gal	57.6 b	1.9 b	0.4 b	100 a	53.6 b	11.9 b
BASF 5600 3F at 10.24 fl oz plus Sylgard 309 at 0.03% V/V	6.0 c	0.1 b	0.0+ b	60.8 b	2.4 c	0.9 c
GWN-4617 SC at 3.4 fl oz plus Break-Thru at 4 fl oz/100 gal ...	6.8 c	0.1 b	0.0+ b	43.6 b	1.6 c	0.6 c

* Means followed by the same letter do not differ significantly based on Fisher's protected LSD (P=0.05). The data represented as 0.0+ indicate the value was very low but not equal to zero.

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