

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

J. W. Pscheidt and John P. Bassinette  
Dept. of Botany and Plant Pathology  
Oregon State University  
Corvallis, OR 97331-2903

### **Pinot Noir tolerance to various fungicide tank mixes, 2012.**

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 27 to 28 Mar. Shoot thinning and sucker removal by hand occurred on 11 Jun. Canes were cut above the top wire on 5 Jul and maintained at this height throughout the growing season. Each treatment was replicated on 4 sets of 5 vines. Treatments were applied approximately every 14 days using a hooded boom sprayer at 150 psi. The rate of water used was 48 or 82 gal/A depending on time of year. Approximately 1.4 or 2.2 gal of spray suspension was used per 20 vines depending on time of year. Fungicides were applied on 1 Jun (BBCH 15), 14 Jun (BBCH 55), 27 Jun (BBCH 61), 11 Jul (BBCH 72), 25 Jul (BBCH 77), 7 Aug (BBCH 80), and 21 Aug (BBCH 81, start of Veraison). No fertilizer was applied this year. No leaves were removed from the fruiting zone. AIM (2 fl oz/A) plus BreakThru (1 qt/100 gal water) was applied on 2 May and AIM (2 fl oz/A) plus BreakThru (1 qt/100 gal water) plus Rely (48 fl oz/A) was applied on 15 May for weed control. Envirodor (18 fl oz/A) was applied on 19 Jun to manage grape erineum mites. Fungal infection periods were monitored using an Adcon A730 weather station equipped with standard sensors. According to the Gubler-Thomas powdery mildew forecasting model, there were 10 rain events between budbreak and end of bloom that were favorable for ascospore release and infection: 1 severe infection period (21 May), 6 moderate infection periods (29 Apr, 2, and 25 May, 8, 22 and 25 Jun), and 3 low infection periods (1, 3 and 24 Jun). The risk index varied from 0 to 60 during Jun but shot up past 60 in early Jul and remained high throughout the rest of Jul and Aug until dropping back down in early Sep. Incidence and severity of powdery mildew on leaves and leaf damage were evaluated on 23 Jul and 24 Aug. Incidence and severity of powdery mildew on clusters were evaluated on 6 and 24 Aug. Powdery mildew disease data and leaf damage was collected by randomly examining 50 leaves or clusters from the middle 3 vines of each replicate.

Spring weather conditions in Western Oregon were considered normal to wet. Subtle damage to young leaves was first observed on 4 Jun only 3 days after the first application. Damage was restricted to one age class of leaves and more prominent on vigorous vines. Damaged leaves had numerous small necrotic spots along the leaf margin and showed a slight downward cupping. The highest incidence of leaf damage on 23 Jul was found on vines sprayed with the highest rates of Merivon plus Sylgard 309. The highest incidence of leaf damage on 24 Aug was found on vines sprayed with a tank mix of Merivon, Sylgard 309, DiKaP and Biomin Calcium. Lowest incidence of leaf damage was found on vines treated with Pristine alone, however, the incidence of leaves on vines treated with Merivon alone was not significantly different. Damage to clusters was not observed. Symptoms of powdery mildew were first found on 30 May as flag shoots and individual colonies in nearby blocks. All fungicide treated vines had a low incidence of powdery mildew on leaves and were not significantly different from each other. Some powdery mildew on the clusters was observed on Pristine treated vines while powdery mildew was not observed on clusters of all other treatments.

Table 1. Powdery mildew and phytotoxicity data on leaves.

Treatment and Rate/A	Time of Application **	% Leaves with Powdery Mildew (24 Aug)*		Leaves with phytotoxicity damage (%)	
		Incidence	Severity	23 Jul	24 Aug
Pristine 38 WDG at 12.5 oz then Pristine 38 WDG at 23 oz.....	A, B, C D, E, F, G...	0.0	0.0	2.0 c	0.0 c
Merivon 500 SC at 5.5 fl oz then Merivon 500 SC at 11 fl oz.....	A, B, C D, E, F, G...	0.0	0.0	4.0 c	1.0 c
Merivon 500 SC at 5.5 fl oz plus Sylgard 309 at 4 fl oz/100 gal then Merivon 500 SC at 11 fl oz plus Sylgard 309 at 4 fl oz/100 gal....	A, B, C A, B, C D, E, F, G D, E, F, G...	1.0	0.0+	16.0 ab	6.5 b
Merivon 500 SC at 11 fl oz plus Sylgard 309 at 4 fl oz/100 gal then Merivon 500 SC at 22 fl oz plus Sylgard 309 at 4 fl oz/100 gal....	A, B, C A, B, C D, E, F, G D, E, F, G...	0.0	0.0	19.0 a	7.5 b
Merivon 500 SC at 5.5 fl oz plus Sylgard 309 at 4 fl oz/100 gal plus RX-Supra at 48 fl oz plus DiKaP WP at 1 lb then Merivon 500 SC at 11 fl oz plus Sylgard 309 at 4 fl oz/100 gal DiKaP WP at 1 lb plus Biomin Calcium SC at 32 fl oz....	A, B, C A, B, C A, B C D, E, F, G D, E, F, G D E, F, G...	0.0	0.0	9.5 bc	13.0 a

\* Means followed by the same letter do not differ significantly based on Fisher's protected LSD (P=0.05). Means without letters do not differ significantly. The data represented as 0.0+ indicate the value was very low but not equal to zero.

\*\* Fungicides were applied on A = 1 Jun (BBCH 15), B = 14 Jun (BBCH 55), C = 27 Jun (BBCH 61), D = 11 Jul (BBCH 72), E = 25 Jul (BBCH 77), F = 7 Aug (BBCH 80), and G = 21 Aug (BBCH 81, start of Veraison). The rate of water used was 48 gal/A for the first 3 applications and 82 gal/A for the last 4 applications.

Table 2. Powdery mildew data on clusters.

Treatment and Rate/A	Time of Application**	% Clusters with Powdery Mildew (24 Aug)*	
		Incidence	Severity
Pristine 38 WDG at 12.5 oz then	A, B, C		
Pristine 38 WDG at 23 oz.....	D, E, F, G...	25.5 a	0.7 a
Merivon 500 SC at 5.5 fl oz then	A, B, C		
Merivon 500 SC at 11 fl oz.....	D, E, F, G...	0.0 b	0.0 b
Merivon 500 SC at 5.5 fl oz plus	A, B, C		
Sylgard 309 at 4 fl oz/100 gal then	A, B, C		
Merivon 500 SC at 11 fl oz plus	D, E, F, G		
Sylgard 309 at 4 fl oz/100 gal....	D, E, F, G...	0.0 b	0.0 b
Merivon 500 SC at 11 fl oz plus	A, B, C		
Sylgard 309 at 4 fl oz/100 gal then	A, B, C		
Merivon 500 SC at 22 fl oz plus	D, E, F, G		
Sylgard 309 at 4 fl oz/100 gal....	D, E, F, G...	0.0 b	0.0 b
Merivon 500 SC at 5.5 fl oz plus	A, B, C		
Sylgard 309 at 4 fl oz/100 gal plus	A, B, C		
RX-Supra at 48 fl oz plus	A, B		
DiKaP WP at 1 lb	C		
then			
Merivon 500 SC at 11 fl oz plus	D, E, F, G		
Sylgard 309 at 4 fl oz/100 gal	D, E, F, G		
DiKaP WP at 1 lb plus	D		
Biomin Calcium SC at 32 fl oz....	E, F, G...	0.0 b	0.0 b

\* Means followed by the same letter do not differ significantly based on Fisher's protected LSD (P=0.05).

\*\* Fungicides were applied on A = 1 Jun (BBCH 15), B = 14 Jun (BBCH 55), C = 27 Jun (BBCH 61), D = 11 Jul (BBCH 72), E = 25 Jul (BBCH 77), F = 7 Aug (BBCH 80), and G = 21 Aug (BBCH 81, start of Veraison). The rate of water used was 48 gal/A for the first 3 applications and 82 gal/A for the last 4 applications.

#### Acknowledgements

We wish to thank Stephanie Heckert and Jade Florence for helping with data collection.