

GRAPE (*Vitis vinifera* 'White Riesling')
Powdery Mildew; *Erysiphe necator*

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Efficacy of fungicides for management of grape powdery mildew, 2012.

Fungicide treatments were arranged in a randomized complete block design in a block of 'White Riesling' planted in 1995 on a 7x10 ft spacing. Vines were trained to a bilateral cordon with spur pruning. Vines were pruned from 20 to 22 Feb. Sucker removal and shoot thinning by hand, occurred from 23 to 29 May. Vines were pruned to approximately 60 spurs/vine and thinned to approximately 40 shoots/vine. Canes were cut above the top wire on 16 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 80 to 148 gal/A such that approximately 2.6 to 4.9 gal of spray suspension was used per 20 vines depending on amount of foliage present. Fungicides were applied on 5 Jun (BBCH 14), 19 Jun (BBCH 53), 3 Jul (BBCH 64), 17 Jul (BBCH 72), 31 Jul (BBCH 78) and 14 Aug (BBCH 80). Rex Lime Sulfur (4 gal/100 gal water) was applied on 8 Mar to all dormant vines to reduce powdery mildew pressure. Goal 2XL (20 fl oz/A) plus generic glyphosate (1 qt/A formulated product) was applied on 2 Apr and Chateau (12 oz/A) plus Rely (16 fl oz/A) was applied on 25 Apr for weed control. Envidor (18 fl oz/A) was applied on 14 Jun to manage grape erineum mites. Vines were fertilized with 16-16-16+6S at a rate of 75 lb/A on 22 May. No leaves were removed from the fruiting zone. 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 were evaluated on 24 Jul and 28 Aug. Incidence and severity of powdery mildew on clusters were evaluated on 30 Jul, 20 and 29 Aug. Powdery mildew disease data was collected by arbitrarily 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 in Western Oregon were considered normal to wet. Symptoms of powdery mildew were first found on 30 May as flag shoots and individual colonies in nearby blocks. All fungicide treated vines had significantly less powdery mildew on leaves or clusters when compared to nontreated vines. Lowest incidence and severity of powdery mildew on leaves was on vines treated with TopGuard alone, however, both incidence and severity on vines treated with most any other fungicide were not significantly different, except for incidence on vines treated with GWN 10087 or Quintec alone. All fungicide treated vines had a low AUDPC for leaves and were not significantly different from each other. Lowest incidence of powdery mildew on clusters was on vines treated with Merivon, however, the incidence on clusters treated with Pristine, Luna Experience or Luna Tranquility were not significantly different. Lowest severity of powdery mildew on clusters was on vines treated with Merivon, however, the severity on clusters treated with most other fungicides were not significantly different, except for those treated with the low rate of GWN 10087, Quintec alone, or the low rate of Mettle. Most fungicide treated vines had a low AUDPC for clusters and were not significantly different from each other except vines treated with the low rate of Mettle. A few young leaves treated on 19 Jun with an accidentally high rate of GWN 10087 at 48 fl oz/A developed subtle small necrotic spots either along the leaf margin or blade. No other leaves were damaged after rates were lowered to 32 fl oz/A. Leaf phytotoxicity was not observed on Merivon treated vines.

Treatment and Rate/A**	% Leaves with Powdery Mildew (28 Aug)*		AUDPC* (Leaves)	% Clusters with Powdery Mildew (29 Aug)*		AUDPC* (Clusters)
	Incidence	Severity		Incidence	Severity	
Nontreated.....	100 a	22.5 a	5.5 a	100 a	100 a	28.6 a
Torino at 3.4 fl oz	5.0 d	0.1 b	0.0+ b	67.0 b	5.2 bcde	1.5 bc
GWN 10087 at 24 fl oz**.....	25.5 b	0.4 b	0.1 b	52.0 bc	7.0 bc	1.0 c
GWN 10087 at 32 fl oz**.....	31.0 b	0.6 b	0.2 b	44.5 bcd	2.5 bcde	0.5 c
Quintec at 4 fl oz plus Sylgard 309 at 3.84 fl oz/100 gal..	13.5 c	0.2 b	0.1 b	66.5 bc	6.9 bcd	2.0 bc
TopGuard SC at 10 fl oz.....	4.0 d	0.0+ b	0.0+ b	54.0 bc	5.7 bcde	1.7 bc
Sovran at 4.8 oz then TopGuard SC at 10 fl oz then Quintec at 4 fl oz then start over again**.....	10.0 cd	0.2 b	0.1 b	37.5 bcde	1.5 cde	0.3 c
Mettle 125 ME at 5 fl oz.....	8.5 cd	0.1 b	0.0+ b	68.0 b	8.5 b	3.1 b
Mettle 125 ME at 5 fl oz plus IR-3121 at 32 fl oz.....	5.5 cd	0.1 b	0.0+ b	35.5 cde	3.6 bcde	0.8 c
Luna Expreince SC at 6 fl oz.....	8.5 cd	0.1 b	0.0+ b	14.0 def	0.5 cde	0.1 c
Luna Expreince SC at 6 fl oz alternate Flint 50 WDG at 3 oz.....	8.5 cd	0.1 b	0.1 b	8.5 ef	0.2 de	0.0+ c
Luna Tranquility SC at 12 fl oz alternate Flint 50 WDG at 3 oz.....	7.0 cd	0.1 b	0.0+ b	10.5 ef	0.3 cde	0.1 c
Pristine 38 WDG at 12 oz plus Sylgard 309 at 3.84 fl oz/100 gal..	6.0 cd	0.1 b	0.0+ b	12.5 ef	0.4 cde	0.1 c
Merivon 500 SC at 4 fl oz Sylgard 309 at 3.84 fl oz/100 gal..	5.5 cd	0.1 b	0.0+ b	2.0 f	0.1 e	0.0+ c
Merivon 500 SC at 5 fl oz Sylgard 309 at 3.84 fl oz/100 gal..	8.5 cd	0.1 b	0.1 b	4.0 f	0.1 e	0.0+ c

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

** Fungicides were applied on 5 Jun (BBCH 14), 19 Jun (BBCH 53), 3 Jul (BBCH 64), 17 Jul (BBCH 72), 31 Jul (BBCH 78) and 14 Aug (BBCH 80). For treatment 7, Sovran was applied on 5 Jun and 17 Jul, TopGuard on 19 Jun and 31 Jul and Quintec on 3 Jul and 14 Aug. Applications of GWN 10087 on 5 Jun were at a rate of 10 and 12 fl oz/A, respectively, and on 19 Jun were 24 and 48 fl oz/A, respectively and on all succeeding applications at 24 and 32 fl oz/A, respectively.

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