

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

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Efficacy of fungicides for management of grape powdery mildew, 2011.

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 1 to 2 Mar. Sucker removal and shoot thinning by hand, occurred from 7 to 12 Jun. Vines were pruned to approximately 60 spurs/vine and thinned to approximately 40 shoots/vine. Canes were cut above the top wire on 19 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 147 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 14 Jun (BBCH 15), 29 Jun (BBCH 57), 13 Jul (BBCH 66), 22 Jul (BBCH 72), 4 Aug (BBCH 77), 18 Aug (BBCH 78) and 1 Sep (BBCH 79-80). Rely (5 pt/A) was applied on 12 May for sucker and 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: 2 severe infection periods (26 and 30 May), 3 moderate infection period (17 and 25 May and 12 Jun), and 4 low infection periods (11 and 28 May, 1 and 2 Jun). The risk index briefly climbed above 60 in early Jul, dropped back to zero by mid-Jul, then shot up past 60 again just before 1 Aug and remained high throughout Aug until dropping back down in early Sep. Incidence and severity of powdery mildew on leaves were evaluated on 1, 16 and 30 Aug and 14 Sep. Incidence and severity of powdery mildew on clusters were evaluated on 10 and 24 Aug and 15 Sep. 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 ($\sum [Y_{i+1} + Y_i]/2][X_{i+1}-X_i]$ 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 cool and wet resulting in slow crop development and a 2 to 3 week delay in crop growth stages through the growing season. Symptoms of powdery mildew were first found on 6 Jun as flag shoots and individual colonies in nearby blocks. Disease pressure was considered severe. Vines treated with the low rate of Bexar, Silwet alone or MBI-10605 alternate JMS Stylet Oil had leaf powdery mildew incidence that was not significantly different from nontreated vines. All fungicide treated vines had significantly less powdery mildew severity on leaves when compared to nontreated vines. Lowest incidence and severity of powdery mildew on leaves was on vines treated with Lune Experience alternate Flint, however, both incidence and severity on vines treated with Orius plus Incognito, Unicorn alternate Pristine, Inspire Super alternate Flint, and all Torino rates were not significantly different. Most fungicide treated vines had a low AUDPC for leaves and were not significantly different from each other except Silwet alone or MBI-10605 alternate JMS Stylet Oil. By Sep 15, all clusters on nontreated vines or vines treated with Orius alone, Incognito alone, Bexar, Silwet alone or MBI-10605 alternate JMS Stylet Oil had some powdery mildew. Lowest incidence of powdery mildew on clusters was on vines treated with the high rate of Torino. Powdery mildew severity was also 100% for nontreated vines and vines treated with Silwet alone, however, powdery mildew severity on clusters from vines treated with Incognito alone, Bexar, or MBI-10605 alternate JMS Stylet Oil were not significantly different. The AUDPC for clusters followed a similar trend. Lowest AUDPC for clusters was found on vines treated with the high rate of Torino, however, the area on vines treated with the middle rate of Torino, Luna Experience alternate Flint or Inspire Super alternate Flint were not significantly different. No phytotoxicity was observed on any vines treated with any fungicide.

Treatment and Rate/A**	% Leaves with Powdery Mildew (14 Sep)*		AUDPC* (Leaves)	% Clusters with Powdery Mildew (15 Sep)*		AUDPC* (Clusters)
	Incidence	Severity		Incidence	Severity	
Nontreated.....	100 a	64.5 a	29.0 a	100 a	100 a	35.0 a
Orius 20 AQ at 8.6 fl oz.....	56.0 e	1.4 de	0.7 d	100 a	65.1 bc	23.2 ab
Incognito 85 WDG at 12.8 oz.....	80.5 bc	2.8 de	1.7 d	100 a	98.9 a	34.2 a
Orius 20 AQ at 8.6 fl oz plus Incognito 85 WDG at 12.8 oz.....	20.0 f	0.3 de	0.2 d	95.0 a	53.7 cd	18.9 cd
Unicorn DF at 2.5 lb alternate Pristine 38 WDG at 10.5 oz plus Silwet L-77 at 4 fl oz/100 gal..	14.0 f	0.4 de	0.1 d	95.0 a	24.7 ef	9.4 ef
Luna Expreince 400 SC at 8 fl oz alternate Flint 50 WDG at 2 oz.....	7.5 f	0.1 e	0.1 d	40.0 d	1.5 f	0.9 g
Inspire Super at 20 oz alternate Flint 50 WDG at 2 oz.....	14.5 f	0.2 e	0.1 d	83.0 ab	16.2 ef	6.6 fg
Torino at 2.75 fl oz plus Break-Thru at 4 fl oz/100gal	18.5 f	0.3 e	0.1 d	67.5 bc	32.2 de	8.4 f
Torino at 3.4 fl oz plus Break-Thru at 4 fl oz/100gal	15.0 f	0.3 de	0.1 d	50.0 cd	16.6 ef	4.2 fg
Torino at 4.25 fl oz plus Break-Thru at 4 fl oz/100gal	17.5 f	0.2 e	0.1 d	8.0 e	0.2 f	0.7 g
Bexar 15 SC at 21 fl oz plus Silwet L-77 at 4 fl oz/100 gal	92.5 ab	8.6 cd	3.4 d	100 a	99.9 a	34.4 a
Bexar 15 SC at 24 fl oz plus Silwet L-77 at 4 fl oz/100 gal	74.5 cd	4.8 de	2.5 d	100 a	92.1 ab	29.7 ab
Silwet L-77 at 4 fl oz/100 gal	100 a	16.8 c	7.3 c	100 a	100 a	35.0 a
MBI-10605 at 64 fl oz alternate Vivando 300 SC at 10 fl oz.....	62.0 de	2.4 de	1.4 d	95.0 a	41.4 cde	15.8 de
JMS Stylet Oil at 1 gal/100 gal alternate MBI-10605 at 32 fl oz plus Vigor Cal at 32 fl oz.....	100 a	35.5 b	12.9 b	100 a	95.9 a	34.5 a

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

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