

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

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Efficacy of fungicide for management of grape powdery mildew on Riesling, 2016.

Fungicide treatments were arranged in a randomized complete block design in a vineyard 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 25 Feb to 3 Mar. Sucker removal and shoot thinning by hand occurred 25 Apr to 3 May. Canes were cut above the top wire on 15 Jun and maintained at this height throughout the growing season. Each treatment was replicated on 4 sets of 5 vines. Treatments were applied using a hooded boom sprayer at 150 to 200 psi using 80 to 147 gal water/A, depending on time of year, such that 2.5 to 4.9 gal of spray suspension was used per 20 vines, depending canopy growth. Fungicides were applied on 6 May (BBCH 14), 21 May (BBCH 57), 4 Jun (BBCH 63), 17 Jun (BBCH 73), 30 Jun, 14 Jul (BBCH 77), and 28 Jul (BBCH 81, start of Veraison). Rows were side dressed with a 16-16-16 fertilizer at 100 lb/A on 12 Apr. No leaves were removed from the fruiting zone. Makaze (generic glyphosate at 32 fl oz/A) plus AIM (2 fl oz/A) was applied on 2 Mar and Forefit 280 (64 fl oz/A) was applied on 10 May for management of weeds. Thiolut (6 lb/A) was applied 20 and 29 Apr, Envidor (18 oz/A) was applied on 9 May and Movento (6 fl oz/A) was applied on 24 Jun all for management of erineum mites. According to the Gubler-Thomas powdery mildew forecasting model, there were 6 rain events between bud break and end of bloom that were favorable for ascospore release and infection: 1 severe infection period (14 May), 3 moderate infection periods (13, 21 and 23 Apr) and 2 low infection periods (4 May and 2 Jun). The risk index stayed low until the first week of Jul when it shot up past 60, remained high until 16 Aug when it dropped below 60 for 8 days during a hot period, then back above 60 through to the end of Sep. Incidence and severity of powdery mildew on leaves was evaluated from 18 to 19 Aug. Incidence and severity of powdery mildew on fruit was evaluated from 15 to 17 Aug. Powdery mildew disease data was collected by randomly examining 50 leaves or clusters from the middle 3 vines of each replicate.

Spring growing conditions were considered warmer and dryer than normal with several heat spikes including 83°F on 7 Apr, 85°F on 18 Apr, 87°F on 2 May, and 95°F on 4 Jun. Conditions resulted in accelerated vine growth 2 to 3 weeks ahead of average. Symptoms of powdery mildew were first found in this block on 26 Apr as flag shoots and a few individual colonies. All fungicide-treated vines had significantly less powdery mildew on leaves when compared to non-treated vines. Lowest incidence of powdery mildew on leaves was found on vines treated with TopGuard alone but was not significantly different from vines treated with Luna Experience or the low rate of Fracture. All fungicide-treated vines had a low severity of powdery mildew on leaves and were not significantly different from each other except for vines treated with Fracture alone. All clusters on non-treated vines had powdery mildew but the amount found on vines treated with Fracture alone was not significantly different. Lowest incidence of powdery mildew on clusters was found on vines treated with the lower rate of Luna Experience alternated with Quintec but was not significantly different from any vines treated with Luna Experience, TopGuard alone or the higher rate of Fracture. All fungicide-treated vines had a low severity of powdery mildew on clusters and were not significantly different from each other except for vines treated with Fracture alone. No phytotoxicity was observed on any vines treated with any material.

Treatment & Rate/A or /100 gal water as indicated	Time of Application*	% Leaves with Powdery Mildew (18-19 Aug)*		% Clusters with Powdery Mildew (15-17 Aug)*	
		Incidence	Severity	Incidence	Severity
Non-treated.....	None.....	100 a	74.4 a	100 a	100 a
Rally 40 WSP at 5 oz plus Nu-Film-P at 15 fl oz/100 gal alternate Quintec at 4 fl oz plus Nu-Film-P at 15 fl oz/100 gal.	A, C, E, G B, D, F.....	15.5 c	0.3 c	57.0 b	6.6 c
Luna Experince at 8 fl oz plus Nu-Film-P at 15 fl oz/100 gal alternate Quintec at 4 fl oz plus Nu-Film-P at 15 fl oz/100 gal	A, C, E, G B, D, F.....	6.0 cde	0.2 c	6.5 d	0.2 c
Luna Experince at 8.6 fl oz plus Nu-Film-P at 15 fl oz/100 gal then Flint at 3 oz plus Nu-Film-P at 15 fl oz/100 gal alternate Quintec at 4 fl oz plus Nu-Film-P at 15 fl oz/100 gal	A B, D, F C, E, G.....	5.0 de	0.1 c	9.5 cd	0.2 c
Luna Experince at 8.6 fl oz plus Nu-Film-P at 15 fl oz/100 gal then Gem at 3.8 fl oz plus Nu-Film-P at 15 fl oz/100 gal alternate Quintec at 4 fl oz plus Nu-Film-P at 15 fl oz/100 gal	A B, D, F C, E, G.....	13.0 cde	0.2 c	11.5 cd	0.2 c
TopGuard at 10 fl oz	All.....	4.0 e	0.0+ c	36.0 bcd	3.6 c
Fracture at 24 fl oz	All.....	60.0 b	2.0 b	98.5 a	54.5 b
TopGuard at 10 fl oz then Fracture at 18.3 fl oz then Quintec at 4 fl oz	A, D, G B, E C, F.....	12.0 cde	0.2 c	39.0 bc	5.7 c
TopGuard at 10 fl oz then Fracture at 24 fl oz then Quintec at 4 fl oz	A, D, G B, E C, F.....	14.0 cd	0.2 c	25.0 cd	0.7 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 A = 6 May (BBCH 14), B = 21 May (BBCH 57), C = 4 Jun (BBCH 63), D = 17 Jun (BBCH 73), E = 30 Jun, F = 14 Jul (BBCH 77), and G = 28 Jul (BBCH 81, start of Veraison).