

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

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Efficacy of fungicides for management of grape powdery mildew on Riesling, 2019.

Fungicide treatments were arranged in a randomized complete block design in a block of 'White Riesling' planted in 1985 on a 8x10 ft spacing. Vines were trained to a bilateral cordon with spur pruning. Vines were pruned 7 to 9 Jan. Sucker removal and shoot thinning by hand occurred 7 to 8 May. Canes were cut above the top wire on 27 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 psi at a rate of 80 to 148 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 on canopy growth. Fungicides were applied on 22 May (BBCH 15), 3 Jun (BBCH 60), 17 Jun (BBCH 68), 1 Jul (BBCH 73), 15 Jul (BBCH 77), and 29 Jul (BBCH 79). Makaze (32 fl oz/A) plus Goal 2XL (32 fl oz/A) was applied on 30 Jan and Rely 280 (4 qt/A) was applied on 3 May for management of weeds. No fertilizer or insecticides were applied during the trial. According to the Gubler-Thomas powdery mildew forecasting model, there were 5 rain events between bud break and end of bloom that were favorable for ascospore release and infection: 0 severe infection periods, 3 moderate infection periods (18, 21 and 25 May) and 2 low infection periods (14 and 22 May). The risk index briefly shot up from 0 to past 60 then back down to 0 in mid-May, then back above 60 early June before and during bloom, remained high (above 60) until late June when it dropped below 60 for a week during a cool period, then back above 60 until mid Sep. Incidence and severity of powdery mildew on leaves and clusters was evaluated on 18 Jul, 25 Jul and 12 Aug. Powdery mildew disease data was collected by randomly examining 50 leaves or clusters from the middle 3 vines of each replicate. Treatments were also evaluated by calculating the area under the disease progress curve (AUDPC) which 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.

Rainfall for the growing season (Oct 2018 to Sep 2019) was approximately 5 inches below the 115 yr average but temperatures were at the average of 59.2°F. March precipitation was 3 in below normal while April was 3 in above normal which led to localized flooding from April 9 to 11 in parts of the vineyard prior to bud break. Symptoms of powdery mildew were first found on 13 May as a few individual colonies on scattered vines in this block and flag shoots were observed on 16 May. Highest leaf incidence, severity and AUDPC of powdery mildew was found on non-treated vines. Lowest incidence of powdery mildew on leaves was found on vines treated with Cevya and was significantly less than other treated vines. Lowest severity or AUDPC of powdery mildew on leaves was also found on vines treated with Cevya but was not significantly different from vines treated with Rally/Quintec or Gatten. Lowest incidence or severity of powdery mildew on clusters was found on vines treated with Cevya and was significantly less than other treated vines. Lowest AUDPC of powdery mildew on clusters was found on vines treated with Cevya but was not significantly less than vines treated with Gatten. No phytotoxicity was observed on any vines treated with any material.

Treatment and Rate/A*	% Leaves with Powdery Mildew (12 Aug)**		AUDPC** (Leaves)	% Clusters with Powdery Mildew (12 Aug)**		AUDPC** (Clusters)
	Incidence	Severity		Incidence	Severity	
Nontreated.....	100 a	77.0 a	18.1 a	100 a	100 a	26.0 a
Microthiol Disperss at 5 lb then Rally 40 WSP at 5 oz plus OVS 90 NIS at 16 fl oz/100 gal Alternate with Quintec at 6.6 fl oz.....	80.5 a	5.2 c	0.8 c	100 a	80.0 a	14.3 b
Gatten at 6 fl oz plus Silwet L-77at 8 fl oz/100 gal	93.5 a	8.5 c	1.5 c	100 a	48.7 b	7.6 c
Bexar at 27 fl oz plus Silwet L-77at 8 fl oz/100 gal	94.0 a	21.1 b	4.4 b	100 a	99.1 a	25.5 a
Cevya (BAS 75007) at 4 fl oz plus OVS 90 NIS at 16 fl oz/100 gal..	52.0 b	1.5 c	0.3 c	96.5 b	22.1 c	4.1 c

* Fungicides were applied on 22 May (BBCH 15), 3 Jun (BBCH 60), 17 Jun (BBCH 68), 1 Jul (BBCH 73), 15 Jul (BBCH 77), and 29 Jul (BBCH 79).

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