

GRAPE (*Vitis vinifera* 'Chardonnay')
Powdery Mildew; *Uncinula necator*

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Efficacy of various fungicides for control of grape powdery mildew on Chardonnay, 2003.

Treatments were arranged in a randomized complete block design in a block of 'Chardonnay' planted in 1985 and 1995 on a 7x10 ft spacing. Vines were trained to a bilateral cordon with spur pruning. The number of buds was adjusted based on pruning weights at the rate of 30 buds/kg canes. Shoot thinning occurred 7 and 8 May. Each treatment was replicated on 4 sets of 5 vines. Treatments were applied using a hooded boom sprayer. Rates of water used were 120 gal/A (6 Jun), 149 gal/A (19 Jun), and 163 gal/A on all subsequent applications. Pressure used was 100 psi for the first application, 150 psi on 19 Jun, and 200 psi thereafter. Approximately 4 to 5.4 gal of spray suspension was used per 20 vines depending on time of year and growth of vines. Fungicides were applied on 6 Jun (EL 17), 19 Jun (EL 23), 3 Jul (EL 28), 18 Jul (late Bunch Close), 2 Aug and 15 Aug. All vines (including the check) had an additional application of Lime Sulfur (10 gal/A) on 29 Mar and only fungicide treated vines had an application of Thiloux 80 DF (2.5 lb/A) on 31 May. Leaves were removed from the east side of the fruiting zone on 2 and 3 Jul. According to the Gubler-Thomas powdery mildew forecasting model, there were 4 rain events between budbreak (22 Apr) and end of bloom that were favorable for ascospore release and infection: 2 severe infection periods (23 Apr and 11 May), 1 moderate infection period (4 May), and 1 low infection period (24 May). The risk index climbed above 60 on 29 May and remained high through early Sep (Fig 1). Urea fertilizer was spread within vine rows on 29 Apr at 58 lb/A. Canes were cut down to just above the top wire on 14 Jul and again on 30 Jul. Surflan AS (3 qt/A) plus Glyphos X-TRA (3 qt/A) was applied 16 Apr to manage weeds. Incidence of powdery mildew on leaves was evaluated on 18 Jun, 26 Jun, 9 Jul, 22 Jul, 6 Aug and 20 Aug by randomly examining 100 leaves from the middle 3 vines of each replicate. Severity of powdery mildew on leaves was evaluated on the same dates except 18 Jun. Incidence and severity of powdery mildew on clusters was evaluated on 9 Jul, 22 Jul, 7 Aug, and 19 Aug by randomly examining 50 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.

Symptoms of powdery mildew were first found widely scattered in nontreated vines on 3 Jun with confirmation of sporulation on 10 Jun. All treated vines had significantly less leaf incidence and severity and cluster severity (mid August or AUDPC) when compared to nontreated vines. Cluster incidence was very high in all treatments except those vines treated with Pristine. Pristine treated vines had significantly less leaf and cluster incidence than other vines. There was little difference between fungicide treated vines when leaf severity (20 Aug or AUDPC) was compared. Vines treated with Pristine had the lowest cluster severity (19 Aug or AUDPC), however, vines treated with Quintec were not significantly different. The high level of powdery mildew on vines treated with Rally suggests that our powdery mildew at the Botany and Plant Pathology Farm has become less sensitive (resistant) to this fungicide. No phytotoxicity was observed on any vines treated with any fungicide.

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Treatment and Rate/A	% Leaves with Powdery Mildew (20 Aug)*		AUDPC* (Leaves)	% Clusters with Powdery Mildew (19 Aug)*		AUDPC* (Clusters)
	Incidence	Severity		Incidence	Severity	
Nontreated	100 a	85.1 a	23.0 a	100 a	99.5 a	32.9 a
Rally 40 W 4 oz	44.3 b	0.9 b	0.2 b	100 a	19.5 b	2.9 b
Quintec 250 SC 4 fl oz	47.3 b	0.9 b	0.2 b	97.0 a	3.0 c	0.4 c
Rally 40 W 4 oz alternate with						
Quintec 250 SC 4 oz	49.0 b	0.9 b	0.2 b	100 a	18.3 b	2.3 b
Pristine 38D at 10.5 oz	0.3 c	0.0 b	0.0 b	21.5 b	0.4 c	0.1 c

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