

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

J. W. Pscheidt and Gordon Kenyon
Dept. of Botany and Plant Pathology
Oregon State University
Corvallis, OR 97331-2903

EFFICACY OF VARIOUS FUNGICIDES FOR CONTROL OF GRAPE POWDERY MILDEW ON CABERNET SAUVIGNON, 2002: Fungicide treatments were arranged in a randomized complete block design in a block of 'Cabernet Sauvignon' planted in 1985 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 35 to 40 buds/kg canes. Shoot thinning occurred 16 May. Each treatment was replicated on 4 sets of 5 vines. Fungicide applications were applied using a hooded boom sprayer. Rates of water used were 93 gal/A (3 Jun), 120 gal/A (17 Jun), 150 gal/A (24 Jun, 2 and 8 Jul), and 200 gal/A on all subsequent applications. Pressure used was 100 psi for the first 2 applications, 150 psi for the next three and 200 psi thereafter. Approximately 3 to 7 gal of spray suspension was used per 20 vines depending on time of year and growth of vines. Fungicides were applied at various intervals with Abound, Rally and Quintec on 14 day intervals while Microthiol Disperss and QRD were on 7 day intervals. All vines were treated with Thiloux 80 DF (4 lb/A) on 24 May. Abound or Rally were applied on 3 Jun (EL13), 24 Jun (25% bloom), 15 Jul (EL29), 6 Aug, and 27 Aug (early veraison). Microthiol Disperss or QRD were applied on 17 Jun (EL17), 8 Jul (EL27), 30 Jul, and 20 Aug. Quintec applications were on 3 Jun (EL13), 17 Jun (EL17), 2 Jul (70 % bloom), 15 Jul (EL29), 30 Jul, 13 Aug, and 27 Aug (early veraison). A nontreated control was not included since one was included on Chardonnay vines interspersed throughout this same block. No leaves were removed from the fruiting zone. According to the Gubler-Thomas powdery mildew forecasting model, there were 8 rain events between budbreak (18 Apr) and end of bloom that were favorable for ascospore release and infection: 4 severe infection periods (19 and 27 May, 17 and 27 Jun), 2 moderate infection periods (26 Apr and 8 Jun), and 2 low infection periods (13 and 16 May). The risk index climbed above 60 on 24 Jun and remained high through mid Sep. No fertilizer was applied this year. Cassaron 4G (150 lb/A) was initially applied to control weeds in the vine row on 1 Feb and completed on 18 Feb. Glyphos xtra (4 qt/A) was applied 10 May to manage weeds which had already emerged. Incidence of powdery mildew on leaves was evaluated on 10 Jul, 26 Jul, 2 Aug, 21 Aug, 6 Sep and 13 Sep by randomly examining 100 leaves from the middle 3 vines of each replicate. Severity of powdery mildew on leaves was evaluated on 2 Aug, 21 Aug, 6 Sep and 13 Sep by randomly examining 100 leaves from the middle 3 vines of each replicate. Incidence and severity of powdery mildew on clusters was evaluated on 29 Jul, 12, and 30 Aug, respectively, 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 ($\Sigma[Y_{i+1} + Y_i]/2][X_{i+1}-X_i]$ 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.

Light frost conditions occurred on 4 and 8 May with light to moderate damage to grape blocks. Powdery mildew was first found widely scattered on adjacent, nontreated Chardonnay vines on 19 Jun just before the risk index increased to over 60. These nontreated Chardonnay vines had the following powdery mildew ratings: leaf incidence of 100% on 21 Aug, leaf severity of 46% on 21 Aug, cluster incidence of 100 % on 26 Aug and cluster severity of 100% on 26 Aug. Based on prior year's results, nontreated Cabernet Sauvignon vines would have had similar levels. Vines treated with Quintec had the lowest amount of powdery mildew on the leaves (all measures), although powdery mildew levels on vines treated with the Abound/Microthiol Disperss/Rally alternation were not significantly different. Vines treated with Quintec had the lowest amount of powdery mildew on the clusters (all measures), although powdery mildew levels on vines treated with the Abound/Microthiol Disperss/Rally alternation were not significantly different (except for cluster incidence). Substituting QRD for Microthiol in the alternation treatments resulted in significantly more powdery mildew on leaves. Substituting QRD for Microthiol in the alternation treatments did not result in significantly higher cluster incidence but did result in significantly higher cluster severity or AUDPC when the higher rate of QRD was used. No phytotoxicity was observed on any vines treated with any fungicide.

Treatment and Rate/A	% Leaves with Powdery Mildew (21 Aug) ¹		AUDPC ¹ (Leaves)	% Clusters with Powdery Mildew (30 Aug) ¹		AUDPC ¹ (Clusters)
	Incidence	Severity		Incidence	Severity	
³ Abound 14.2 fl oz then Microthiol Disperss 8 lb then Rally 40 W 5 oz then Microthiol Disperss 8 lb then Abound 14.2 fl oz then Microthiol Disperss 8 lb then Rally 40 W 5 oz then Microthiol Disperss 8 lb then Abound 14.2 fl oz	10.0	0.2	0.1	92.5	5.2	1.1
	b	b	b	a	bc	bc
³ Abound 14.2 fl oz then QRD 137 WP at 4 lb then Rally 40 W 5 oz then QRD 137 WP at 4 lb then Abound 14.2 fl oz then QRD 137 WP at 4 lb then Rally 40 W 5 oz then QRD 137 WP at 4 lb then Abound 14.2 fl oz	26.0	0.5	0.3	99.0	10.4	2.0
	a	a	a	a	ab	ab
³ Abound 14.2 fl oz then QRD 137 WP at 6 lb then Rally 40 W 5 oz then QRD 137 WP at 6 lb then Abound 14.2 fl oz then QRD 137 WP at 6 lb then Rally 40 W 5 oz then QRD 137 WP at 6 lb then Abound 14.2 fl oz	27.8	0.5	0.3	100	13.1	3.1
	a	a	a	a	a	a
² Quintec 3 fl oz	12.5	0.2	0.1	59.0	1.1	0.3
	b	b	b	b	c	c
² Quintec 4 fl oz	9.0	0.1	0.1	50.5	0.8	0.2
	b	b	b	b	c	c

¹ Means followed by the same letter do not differ significantly based on Fisher's protected LSD (P=0.05).

² Quintec applications were on 3 Jun (EL13), 17 Jun (EL17), 2 Jul (70 % bloom), 15 Jul (EL29), 30 Jul, 13 Aug, and 27 Aug (early veraison).

³ Abound or Rally were applied on 3 Jun (EL13), 24 Jun (25% bloom), 15 Jul (EL29), 6 Aug, and 27 Aug (early veraison). Microthiol Disperss or QRD were applied on 17 Jun (EL17), 8 Jul (EL27), 30 Jul, and 20 Aug.