

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

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#### **Efficacy of various fungicides for control of grape powdery mildew on White Riesling, 2004.**

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. Shoot thinning occurred 14 May. Each treatment was replicated on 4 sets of 5 vines. Treatments were applied using a hooded boom sprayer. Rates of water used were 65 gal/A (12 May), 133 gal/A (21 May and 6 Jun), and 170 gal/A on all subsequent applications. Pressure used was 100 psi for the first application, 150 psi on 21 May, 6 Jun and 200 psi thereafter. Approximately 2.1 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 12 May (EL 10-12 or 6-10 in shoots), 21 May (EL 15), 5 Jun (EL 17), 12 Jun (EL 21 or 30% bloom), 19 Jun (EL 25-26 or 100% bloom), 3 Jul, 16 Jul (EL 33), 23 Jul, 30 Jul, 13 Aug (EL 35 or 50% Veriason). 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: 1 severe infection period (18 Apr), 6 moderate infection periods (6, 7, 17, 27, and 28 May and 8 Jun), and 2 low infection periods (5 and 6 Jun). The risk index for the year was uncharacteristically variable with brief periods above 60 in early May, early Jun and mid-Sep (Fig 1). A longer period above 60 started after 27 Jun through 12 Aug when high temperatures followed by rain drove it down again (Fig 1). During this period the index briefly dropped below 60 in late July. Urea fertilizer was spread within vine rows on 3 May at 58 lb/A. Canes were cut down to just above the top wire on 14 Jul. Rely (3qt/A) was applied in the vine row on 10 May to manage weeds. Incidence of powdery mildew on leaves was evaluated on 14 Jul, 27 Jul, 9 Aug, and 30 Aug by randomly examining 50 leaves (25 from each side) from the middle 3 vines of each replicate. Severity of powdery mildew on leaves was evaluated on the same dates except 14 Jul. Incidence of powdery mildew on clusters was evaluated on 14 Jul, 26 Jul, 9 Aug, and 30 Aug by randomly examining 50 clusters from the middle 3 vines of each replicate. Comparisons among treatments for severity of powdery mildew on leaves 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 20 May. Powdery mildew symptoms on nearby Chardonnay vines developed between 2 May and 15 May when many colonies were observed. All treated vines had significantly less leaf incidence and severity and cluster severity when compared to nontreated vines. Cluster incidence was very high in all treatments. Pristine treated vines had significantly less leaf and cluster incidence than other vines. There was little difference between fungicide treated vines when leaf severity (30 Aug or AUDPC) was compared. Vines treated with Pristine had the lowest cluster severity, however, vines treated with Quintec (in any combination) were not significantly different. There was no significant difference in powdery mildew measurements on vines treated with Quintec at a 2 (4 fl oz/A) or 3 (6.6 fl oz/A) week intervals. There was no significant difference in powdery mildew measurements on vines treated with Sonata plus Silwet or Silwet alone. Vines treated with Silwet alone had significantly less powdery mildew than nontreated vines (all measures) but significantly more than vines treated with Pristine except when leaf severity AUDPC is compared. Powdery mildew control on vines treated with Silwet was not significantly different than Quintec treated vines when leaf incidence and severity (30 Aug or AUDPC) are compared. Vines treated with Silwet alone had significantly more powdery mildew than Quintec treated vines when cluster severity is compared. No phytotoxicity was observed on any vines treated with any fungicide.

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Treatment and Rate/A	Time of Application	% Leaves with Powdery Mildew (30 Aug)*		AUDPC* (Leaves)	% Clusters with Powdery Mildew (16 Aug)*	
		Incidence	Severity		Incidence	Severity
Nontreated .....	None.....	100.0 a	83.4 a	24.9 a	100.0 a	100.0 a
Thiolux 80 DF at 5 lb then Rally 40 W at 5 oz ..	A B, C, E, F, G, I, J	41.0 c	1.0 bc	0.2 b	99.5 a	43.8 c
Thiolux 80 DF at 5 lb then Quintec 250 SC at 4 fl oz.	A B, C, E, F, G, I, J	60.5 b	1.8 bc	0.3 b	84.5 b	3.8 d
Thiolux 80 DF at 5 lb then Quintec 250 SC at 6.6 fl oz	A B, D, F, H & J...	67.5 b	2.3 bc	0.6 b	87.5 b	15.0 d
Thiolux 80 DF at 5 lb then Quintec 250 SC at 4 fl oz alternated with Rally 40 W at 5 oz ..	A B, C, F, G, J E, I.....	55.0 bc	0.9 bc	0.3 b	95.0 ab	5.6 d
Thiolux 80 DF at 5 lb then Pristine 38 WG 0.66 lb + Silwet L-77 at 0.05% V/V	A B, C, E, F, G, I, J	17.5 d	0.2 c	0.1 b	73.0 c	1.7 d
JMS Stylet Oil at 2.6 qts then Sonata at 4 qts + Silwet L-77 at 0.05% V/V	A B, C, E, F, G, I, J	65.0 b	2.4 bc	0.7 b	100.0 a	71.8 b
JMS Stylet Oil at 2.6 qts then Silwet L-77 at 0.05% V/V..	A B, C, E, F, G, I, J	67.0 b	2.6 b	0.6 b	99.5 a	54.0 bc
Thiolux 80 DF at 5 lb then Silwet L-77 at 0.05% V/V..	A B, C, E, F, G, I, J	66.0 b	2.7 b	0.6 b	100.0 a	54.6 bc
Thiolux 80 DF at 5 lb then Abound at 11 fl oz alternated with Quintec 250 SC at 4 fl oz + Elevate 50 WG at 1 lb...	A B, C, F, I E, G, J.....	55.5 bc	1.2 bc	0.3 b	90.0 ab	8.9 d

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

\*\* Fungicides were applied on A = 12 May (EL 10-12 or 6-10 in shoots), B = 21 May (EL 15), C = 5 Jun (EL 17), D = 12 Jun (EL 21 or 30% bloom), E = 19 Jun (EL 25-26 or 100% bloom), F = 3 Jul, G = 16 Jul (EL 33), H = 23 Jul, I = 30 Jul, J = 13 Aug (EL 35 or 50% Veriason).