

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

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Efficacy of powdered whey for control of grape powdery mildew on Pinot Noir, 2005.

Fungicide treatments were arranged in a randomized complete block design in a block of 'Pinot Noir' (on *V. rupestris* x *V. riparia* 101-14 rootstock) planted in 1998 on a 7x8 ft spacing. A single buffer rootstock plant was trained between each set of treatment vines and a buffer rootstock row separated each varietal row. Pinot Noir vines were trained to a Guyot system. Shoot thinning and sucker removal occurred 6 May by hand. Each treatment was replicated on 5 sets of 5 vines. Treatments were applied approximately every 14 days for the first 3 applications and every 7 days thereafter. Treatments were applied using a hooded boom sprayer at 150 psi for the first 5 applications, and 200 psi for the remaining applications. The rate of water used was 40 to 113 gal/A depending on amount of foliage present. One application on 23 Jun had a rate of 141 gal/A. Approximately 1.6 to 3.7 gal of spray suspension was used per 25 vines depending on time of year. Fungicides were applied on 12 May (EL 10), 25 May (EL 15), 9 Jun (EL 17), 20 Jun (EL 21), 23 Jun (EL 21), 30 Jun (EL24), 7 Jul (EL 27), 14 Jul (EL 28) 21 Jul (Bunch Close), 28 Jul (EL 33), 4 Aug, 12 Aug, and 18 Aug (25% Veraison). Thiolut was applied at the 5 lb rate for the first 4 applications and reduced to 2.5 lb for the 23 Jun and all succeeding applications. No leaves were removed from the fruiting zone. Rely (3 qt/A) was applied to control weeds in the vine row on 13 May and 12 Jul. No fertilizer was applied this year. Canes were cut above the top wire on 6 Jun and maintained at this height throughout the growing season. According to the Gubler-Thomas powdery mildew forecasting model, there were 12 rain events between budbreak and end of bloom that were favorable for ascospore release and infection: 3 severe infection periods (23 Apr, 8 and 17 May), 5 moderate infection periods (1, 3, 5 and 18 May and 6 Jun), and 4 low infection periods (13, 16, and 28 May and 5 Jun). The risk index climbed above 60 in early July and remained high through late Sep. During this period the index briefly dropped below 60 in mid Aug due to hot weather. Incidence and severity of powdery mildew on leaves and clusters was evaluated on 12 Jul, 25 Jul, and 8 Aug by randomly examining 50 leaves or 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 in a nearby block of Pinot Noir as flag shoots on 23 May. Flag shoot have never before been observed in managed vines. Flag shoots were common and found on every third or fourth vine. Some secondary spread had occurred around flag shoots on this date but new colonies had not yet begun to sporulate. Disease pressure was considered extremely high. Symptoms of powdery mildew were first found in this block of Pinot Noir on widely scattered leaves on nontreated vines on 6 Jun. The incidence of powdery mildew on clusters or leaves on vines treated with either water alone or Whey powder was not significantly different than on nontreated vines. All treated vines had significantly less severity of powdery mildew on leaves or clusters when compared to nontreated vines. Whey treated vines had significantly higher powdery mildew severity on leaves or clusters than vines treated with water alone. Whey treated vines were not significantly different than vines treated with water alone with respect to AUDPC for leaves, however, Whey treated vines had a significantly higher cluster AUDPC. Vines treated with JMS stilet oil or Thiolut had the best powdery mildew control and had significantly lower powdery mildew measurements than whey or water treated vines. Whey treated vines had a visible white residue on leaf margins throughout the summer but primarily on the upper leaf surface. No phytotoxicity was observed on any treated vines.

Acknowledgement – The viticultural help from Cosette Carter is appreciated.

Treatment and Rate/100 gal**	% Leaves with Powdery Mildew (8 Aug)*		AUDPC* (Leaves)	% Clusters with Powdery Mildew (8 Aug)*		AUDPC* (Clusters)
	Incidence	Severity		Incidence	Severity	
Nontreated.....	100 a	76.0 a	20.4 a	100 a	99.8 a	26.5 a
Thiolux at 5 lb then						
Thiolux at 2.5 lb after bloom	60.0 c	1.5 d	0.2 c	86.5 b	3.4 d	0.4 d
Whey Powder at 12.5 lb.....	100 a	34.7 b	5.4 b	100 a	67.0 b	15.6 b
Water alone.....	100 a	21.9 c	4.5 b	97.5 a	37.4 c	8.1 c
JMS Stylet Oil at 1.5 gal.....	64.5 b	1.2 d	0.3 c	79.5 b	4.0 d	0.8 d

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

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