

### **Length of grape powdery mildew protection using different rates of Torino at bloom, 2018.**

The objective of this trial was to determine when powdery mildew would increase after a single application of Torino at bloom. Fungicide treatments were arranged in a randomized complete block design in a block of 'Pinot noir' planted in 1985 on a 8x10 ft spacing. Pinot noir vines were trained to a Guyot (vertical shoot position) system and pruned on 1 to 2 Mar. Shoot thinning and sucker removal by hand occurred periodically during the growing season. Canes were cut above the top wire on 12 Jul 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 147 gal water/A depending on canopy growth such that 2.5 to 4.9 gal of spray suspension was used per 20 vines. Microthiol Disperss (5 lb/A) was applied to all fungicide treatments prior to bloom on 16 May (BBCH 14), 25 May (BBCH 55) and 7 Jun (BBCH 57). Torino was applied at different rates on 19 Jun (BBCH 67). No leaves were removed from the fruiting zone. Aim EC (2 fl oz/A) was applied on 18 Apr and Rely 280 (56 fl oz/A) was applied on 16 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: 3 severe infection periods (27 Apr and 8 and 10 Jun), 1 moderate infection period (8 May) and 1 low infection period (10 May). The risk index shot up from 0 to past 60 during bloom about mid to late June, remained high (above 60) until late July when it dropped below 60 for 3 weeks during a hot period in Aug, then back above 60 until mid Sep (Figure 1). Incidence of powdery mildew on fruit was evaluated on 27 Jun, 9, 16, and 23 Jul and 1 Aug. Severity of powdery mildew on fruit was evaluated on 9, 16, and 23 Jul and 1 Aug. Incidence and severity of powdery mildew was not evaluated on leaves. Powdery mildew disease data was collected by arbitrarily examining 50 clusters from the middle 3 vines of each replicate. Treatments were also evaluated by calculating the area under disease progress curve (AUDPC) which was calculated by multiplying the mean incidence or 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.

Spring weather conditions for grapes were considered warm and dry with below normal rainfall. Symptoms of powdery mildew were first found on 14 May as a few individual colonies on scattered vines. (One flag shoot was also observed in a nearby Pinot Gris block.) Powdery mildew on non-treated vines increased rapidly from an average incidence of 4% on 27 Jun to 100% on 9 July (Figure 2). All fungicide treated vines reached 100% incidence by 23 Jul since there were no applications past bloom. All fungicide treatments significantly delayed the epidemic when compared to non-treated vines as shown in Figures 2 and 3 and with AUDPCs in Table 1. Only vines sprayed with the high rate of Torino had a significantly greater delay in the powdery mildew epidemic than vines sprayed with lower rates. This was first detected at the 9 Jul incidence rating and at the 16 Jul severity rating (Figures 2 and 3). No phytotoxicity was observed on any treated vines. Data suggest that more than a 2 week delay in reapplication could be detrimental to successful powdery mildew management. The excessively high rate of Torino might allow a reapplication interval of 3 weeks but more research would be necessary to change recommendations. Reapplication intervals should be no longer than 2 week intervals in western Oregon especially during bloom.

Figure 1. Gubler-Thomas grape powdery mildew risk index for the 2018 growing season.

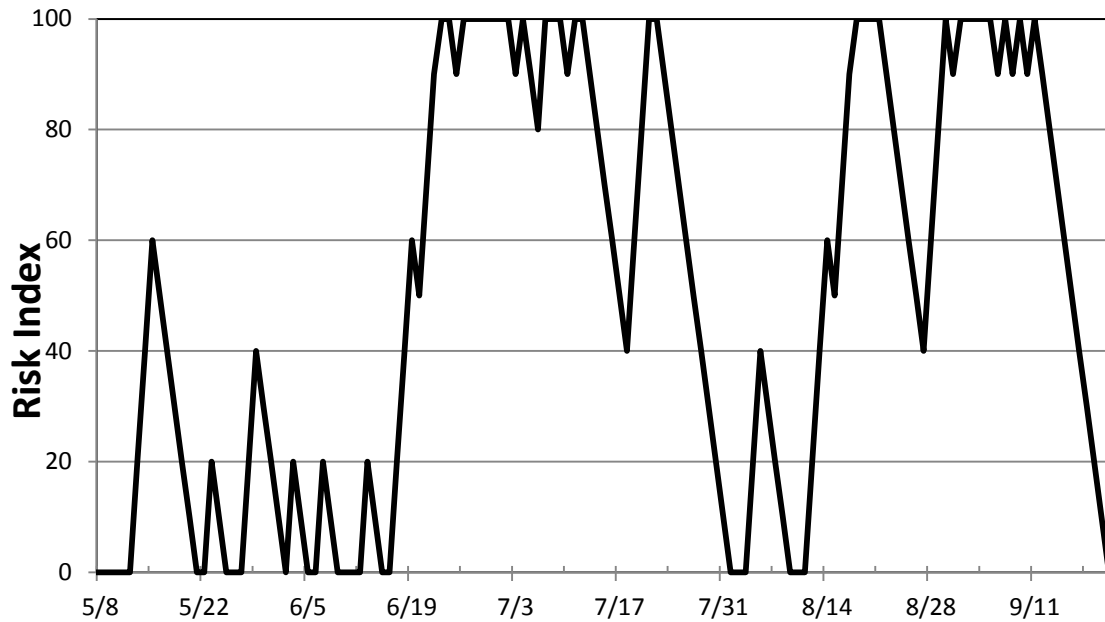


Table 1. Incidence and severity of grape powdery mildew on clusters treated with Torino at bloom.

Treatment & Rate/A or /100 gal water as indicated	Time of Application*	Clusters with Powdery Mildew**			
		Incidence (9 July)	Incidence AUDPC	Severity (23 July)	Severity AUDPC
Non-treated.....	None.....	100 a	25.3 a	99.8 a	22.4 a
Microthiol Disperss at 5 lb then Torino SC at 3.4 fl oz plus Stylet-Oil at 0.5 gal/100 gal ...	A, B, C D.....	34.5 bc	19.6 bc	41.3 b	7.7 b
Microthiol Disperss at 5 lb then Torino SC at 5.1 fl oz plus Stylet-Oil at 0.5 gal/100 gal ...	A, B, C D.....	21.0 cd	18.0 c	30.5 b	6.6 b
Microthiol Disperss at 5 lb then Torino SC at 6.8 fl oz plus Stylet-Oil at 0.5 gal/100 gal ...	A, B, C D.....	43.5 b	20.5 b	47.0 b	8.3 b
Microthiol Disperss at 5 lb then Torino SC at 13.6 fl oz plus Stylet-Oil at 0.5 gal/100 gal ...	A, B, C D.....	6.0 d	15.4 d	10.2 c	3.7 c

\* Fungicides were applied on A = 16 May (BBCH 14), B = 25 May (BBCH 55), C = 7 Jun (BBCH 57), and D = 19 Jun (BBCH 67)

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

Figure 2. Incidence of powdery mildew on clusters treated with various rates of Torino at bloom. Arrow indicates time when the one application of Torino occurred (19 Jun).

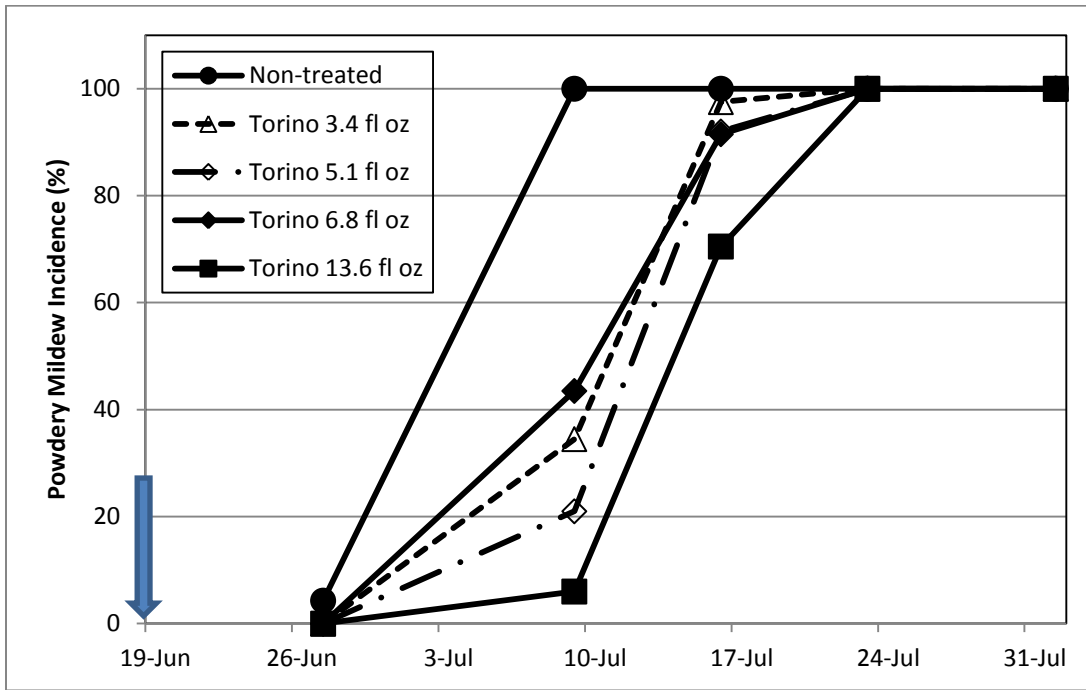


Figure 3. Severity of powdery mildew on clusters treated with various rates of Torino at bloom. Arrow indicates time when the one application of Torino occurred (19 Jun).

