

GRAPE (*Vitis labrusca* 'Niagara')
Downy mildew; *Plasmopara viticola*
Powdery mildew; *Uncinula necator*

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Evaluation of fungicides for control of downy and powdery mildew of grapes, 2009.

This trial was conducted in a mature vineyard at the Lake Erie Regional Grape Research and Extension Center in North East, PA. Vines were trained to a single-curtain, high-wire cordon system. Treatments were applied to 4-vine plots in a randomized complete block design with four replications. A total of five treatment applications were made between 2 Jun and 28 July with a Friend covered-boom plot sprayer at 100 psi. Spray volumes were adjusted to 50 gal/A for the first two (prebloom) applications and 100 gal/A for the final three applications. Plots and plot rows were separated by a buffer plot and a buffer row, respectively. Powdery and downy mildew incidence (% dm, pm) and severity (% area dm, pm) were determined by evaluating 25 clusters on 8 Sep and 25 leaves on 9 Sep selected randomly from the center of each plot. Data were analyzed using analysis of variance.

Rainfall for May, Jun, Jul, Aug, and Sep was 5.6, 5.5, 11.6, 7.1, and 6.9 in., respectively. Wet conditions from bloom (mid-June) through July were favorable for downy mildew development on fruit, and nearly half the crop (47%) was destroyed in the check (Vintage/Quintec). All chemical programs significantly reduced downy mildew incidence and severity on fruit compared to the check. The Revus/Pristine program was statistically superior to all other treatments at reducing downy mildew incidence on fruit, whereas the less rain fast Penncozeb/Ziram programs were least effective. Since the active ingredients in Inspire Super (cyprodinil and difenoconazole) would not be expected to control downy mildew, it appears that a single application of Pristine during the early post bloom period provided nearly 94 % control of downy mildew severity on fruit. With respect to downy mildew on the leaves, the treatments behaved similarly, except that the Inspire Super/Pristine rotation did not quite reduce incidence beyond the statistical tier of the check. Despite little powdery mildew disease development on fruit, there were clear statistical differences between the check (penncozeb/ziram) and all other treatments. The Inspire Super/Pristine rotation was generally superior to all other treatments with respect to leaf disease incidence, with the exception of the Vintage/Quintec program. As most leaf disease developed late in the season after spray programs were terminated, none of the programs reduced powdery mildew severity on leaves when compared to the check. There was no phytotoxicity associated with any treatment.

Treatment and rate/A	Timing ^z	Fruit				Leaves			
		% dm	% area dm ^y	% pm	% area pm ^y	% dm	% area dm ^y	% pm	% area pm ^y
Vintage SC 4 fl oz	1								
Vintage SC 5 fl oz	3								
Quintec 4 fl oz.....	2, 4, 5	90.5 d	47.00 b	2.0 a	0.05 a	100.0 c	9.42 b	13.0 ab	0.30 a ^x
Penncozeb 75DF 4 lb	1, 2								
Ziram 76DF 4 lb.....	3, 4, 5	36.5 bc	2.87 a	10.5 b	0.25 b	70.0 ab	3.14 a	26.0 b	0.84 ab
Inspire Super 20 fl oz	1, 2, 4, 5								
Pristine 10 oz.....	3,	32.4 b	2.89 a	1.0 a	0.02 a	83.0 bc	3.23 a	4.0 a	0.09 a
Revus Top SC 7 fl oz	1, 2, 4								
Pristine 10 oz	3								
Revus 250 SC 8 fl oz + NuFilm P 0.125% (v/v)....	5	0.0 a	0.00 a	2.0 a	0.05 a	55.0 a	1.66 a	23.0 b	0.63 ab
Vintage SC 4 fl oz	1								
Vintage SC 5 fl oz	3,								
Quintec 4 fl oz	2, 4, 5								
Penncozeb 75DF 4 lb	1, 2								
Ziram 76DF 4 lb.....	3, 4, 5	53.0 c	5.37 a	4.0 a	0.09 a	80.0 b	3.22 a	25.0 b	1.24 b

^zTiming: 1 = 2 Jun; 2 = 16 Jun; 3 = 2 Jul; 4 = 14 Jul; 5 = 28 Jul

^ySeverity was rated using the Barratt-Horsfall scale and was converted to % area infected using Elanco conversion tables.

^xMeans within columns followed by the same letter are not significantly different according to Fisher's Protected LSD ($P < 0.05$).