GRAPE (*Vitis labrusca* 'Concord')
Black rot; *Guignardia bidwellii*
Powdery mildew; *Uncinula necator*

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Evaluation of organic fungicides for control of black rot and powdery mildew of Concord grapes, 2010.

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 6 to 8-vine plots in a randomized complete block design with four replications. Treatments were applied at 50 gal/A for application timings 1 and 2, and at 100 gal/A for application timings 3-6 using a Friend covered-boom plot sprayer at 100 psi. In the downwind half of each plot, black rot fruit mummies were hung from the trellis wire at five locations (3 mummies per location) to provide inoculum. The most severe black rot fruit disease occurred on clusters within a 2-ft wide zone centered beneath these mummies. In the downwind half of each plot, black rot incidence (percent clusters with infected fruit) and severity (percent area fruit infected) were determined on 2 Aug from 50 clusters selected randomly from within these zones. In the upwind half of each plot, disease was allowed to develop from naturally occurring inoculum, and powdery mildew and black rot incidence and severity were determined on 29-31 Jul from 50 randomly selected clusters per plot. Leaf powdery mildew incidence and severity were determined on 19-20 August from 50 randomly selected leaves per plot.

Total rainfall for May, Jun, Jul, Aug, and Sep was 3.4, 4.6, 4.6, 2.8, and 6.1 in., respectively. Dry weather from late Jun to mid Jul limited black rot fruit rot development. Under low inoculum pressure (without mummies), little black rot developed and all treatments provided practically complete control of the disease. The presence of black rot mummies in the trellis greatly increased fruit rot and exposed a weakness in Timorex for controlling this disease; Timorex alone did not control black rot under high inoculum conditions. However, all copper based programs significantly controlled the disease when compared to the check, providing 87-97 % reduction of black rot severity. Powdery mildew disease pressure was relatively high during the fruit infection period, but low to moderate for leaf infections. All treatments reduced the incidence and severity of powdery mildew fruit and leaf infections when compared to the check. A tank mix of Champion + lime + Timorex was more effective than all other treatments at reducing leaf disease incidence and more effective than all but Champion + lime and Champion + lime + NuFilm + Regalia 20% at reducing leaf disease severity. No phytotoxicity was associated with any of the treatments.

		Black rot (without mummies)		Black rot (with mummies)	
Treatment and rate/A	Timing[z]	% Infected	% Area infected[y]	% Infected	% Area infected[y]
Champion WP 2 lb + lime 2 lb…….	1, 2, 3, 4, 5, 6	0.0 a[x]	0.00 a[x]	5.0 a[x]	0.12 a[x]
Champion WP 2 lb + lime 2 lb + NuFilm P 0.0625 %.....	1, 2, 3, 4, 5, 6	0.0 a	0.00 a	3.0 a	0.17 a
Champion WP 2 lb + lime 2 lb + NuFilm P 0.0625 % + Regalia 5% @ 0.5 %.....	1, 2, 3, 4, 5, 6	0.0 a	0.00 a	6.0 a	0.27 a
Champion WP 2 lb + lime 2 lb + NuFilm P 0.0625 % + Regalia 20% @ 0.125 %.....	1, 2, 3, 4, 5, 6	0.0 a	0.00 a	8.0 a	0.50 a
Champion WP 2 lb + lime 2 lb + Timorex 0.3%.....	1, 2, 3, 4, 5, 6	1.0 a	0.01 a	10.0 a	0.50 a
Champion WP 2 lb + lime 2 lb Timorex 0.5%.....	2, 4, 6 1, 3, 5	0.0 a	0.00 a	8.0 a	0.59 a
Timorex 0.5%.....	1, 2, 3, 4, 5, 6	0.0 a	0.00 a	43.5 b	4.40 b
Water-treated check……..	1, 2, 3, 4, 5, 6	3.5 b	0.12 b	49.5 b	4.47 b

[z]Timing: 1 = 25 May; 2 = 7 Jun (mid bloom); 3 = 14 Jun (1st post bloom); 4 = 21 Jun; 5 = 28 Jun 6 = 7 Jul
[y]Severity was rated using the Barratt-Horsfall scale and was converted to % area infected using Elanco conversion tables.
[x]Means followed by the same letter within columns are not significantly different according to Fisher's Protected LSD ($\alpha \leq 0.05$).

Treatment and rate/A	Timing[z]	Powdery mildew on fruit			Powdery mildew on leaves		
		% Infected	% Area infected[y]	% Control[x]	% Infected	% Area infected[y]	% Control[x]
Champion 2 lb + lime 2 lb……..	1, 2, 3, 4, 5, 6	50.5 ab[w]	1.48 a[w]	79	83.5 b[w]	7.42 ab[w]	76
Champion WP 2 lb + lime 2 lb + NuFilm P 0.0625 %.....	1, 2, 3, 4, 5, 6	41.0 ab	1.10 a	85	85.5 b	9.59 b	69
Champion WP 2 lb + lime 2 lb + NuFilm P 0.0625 % + Regalia 5 % @ 0.5 %.....	1, 2, 3, 4, 5, 6	39.0 a	1.03 a	86	87.5 b	9.06 b	71
Champion WP 2 lb + lime 2 lb + NuFilm P 0.0625 % + Regalia 20 % @ 0.125 %.....	1, 2, 3, 4, 5, 6	42.0 ab	1.12 a	84	88.5 b	7.06 ab	77
Champion WP 2 lb + lime 2 lb + Timorex 0.3%.....	1, 2, 3, 4, 5, 6	38.5 a	1.02 a	86	61.0 a	3.11 a	90
Champion WP 2 lb + lime 2 lb Timorex 0.5%.....	2, 4, 6 1, 3, 5	55.5 b	2.02 a	72	89.0 b	8.46 b	73
Timorex 0.5%.....	1, 2, 3, 4, 5, 6	51.0 ab	1.83 a	75	89.0 b	11.23 b	64
Water-treated check……	1, 2, 3, 4, 5, 6	91.5 c	7.19 b		100.0 c	31.32 c	

[z]Timing: 1 = 25 May; 2 = 7 Jun (mid bloom); 3 = 14 Jun (1st post bloom); 4 = 21 Jun; 5 = 28 Jun 6 = 7 Jul

[y]Severity was rated using the Barratt-Horsfall scale and was converted to % area infected using Elanco conversion tables.

[x]Percent control = control of disease severity on berries over that of the water-treated check.

[w]Means followed by the same letter within columns are not significantly different according to Fisher's Protected LSD ($\alpha \leq 0.05$).