

Evaluation of alternative and organic fungicides for control of black rot of Niagara grapes, 2007.

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 8-vine plots in a randomized complete block design with four replications. Applications were made with a Friend covered-boom plot sprayer at 100 psi. All treatments were applied at 50 gal/A for application timings 1-3. All subsequent applications were applied at 100 gal/A. In the upwind half of each plot, black rot was allowed to develop only from naturally occurring inoculum in canes (all infected fruit mummies were removed from the trellis). In the downwind half of each plot, black rot fruit mummies were hung from the trellis wire at five locations (5 mummies per location) to increase inoculum pressure. Plots and plot rows were separated by a buffer plot and a buffer row, respectively. Rainfall for May, Jun, Jul, Aug, and Sep was 2.70, 3.26, 5.89, 6.69, and 3.56 in., respectively. The most severe black rot fruit disease occurred on clusters within a 2-ft wide zone centered beneath mummies hung in the trellis. Black rot incidence (percent infected) and severity (percent area infected) were determined on 21-22 Aug from 50 clusters selected randomly from within these zones in the downwind half of each plot, and from 50 randomly selected clusters throughout the upwind half of each plot.

Black rot disease pressure was relatively light to moderate. At higher inoculum pressure (cane inoculum plus mummies) two applications of Champion/lime alone or in a rotation with 2 % lime sulfur, and four applications of Champion/lime were the most effective treatments, significantly reducing black rot incidence (% infected). All treatments significantly reduced black rot severity (% area infected) over the check. At lower inoculum pressure (cane inoculum only) ProPhyt significantly reduced black rot incidence. All fungicide treatments except two applications of Champion/lime (minimal copper program) significantly reduced black rot severity over the check. Early sprays of lime sulfur (1-4) were applied to prevent black rot shoot and cluster stem infections that inoculation trials have shown can contribute significantly to later fruit infections. However, the pre bloom period was relatively dry, and early sprays did not significantly improve a fruit protection program under higher or lower inoculum pressure. Four applications of 2 % lime sulfur were as effective as four applications of Champion/lime at lower inoculum pressure but significantly less effective at higher pressure. The efficacy of all lime sulfur programs and the ProPhyt program improved as inoculum pressure was lowered. Treatment applications for black rot control were not extended past early July due to the continuation of very dry conditions through 4 weeks post bloom. However, when clusters were rated it became clear that most black rot fruit infection had occurred more than 4 weeks after bloom, suggesting that programs would have performed better if coverage had been extended.

Treatment and rate/A	Timing ^z	Black rot on fruit					
		Cane inoculum plus mummies			Cane inoculum only		
		% Infected	% Area ^y infected	% Control ^x	% Infected	% Area ^y infected	% Control ^x
Champion WP 2 lb + Lime 4 lb	5, 6.....	62.0 a ^w	7.94 ab ^w	71	31.0 ab ^w	2.28 ab ^w	40
Lime Sulfur 2 % Champion WP 2 lb + Lime 4 lb	1, 2, 3, 4, 7 5, 6.....	58.5 a	6.75 a	75	24.5 ab	0.82 a	79
Lime Sulfur 1 % Champion WP 2 lb + Lime 4 lb	1, 2, 3, 4, 7 5, 6.....	75.0 ab	13.69 ab	49	25.5 ab	1.01 a	74
Champion WP 2 lb + Lime 4 lb	4, 5, 6, 7....	56.0 a	6.49 a	76	34.5 ab	1.63 a	57
ProPhyt 2.4 pt	4, 5, 6, 7....	85.5 b	12.12 ab	55	18.0 a	0.97 a	75
Lime Sulfur 2 %	4, 5, 6, 7....	70.0 ab	15.93 b	41	26.5 ab	1.96 a	49
Water-treated check	1, 2, 3, 4, 5, 6, 7....	90.0 b	26.98 c		39.5 b	3.82 b	

^zTiming. 1 = 14 May; 2 = 21 May; 3 = 29 May; 4 = 6 Jun (immediate pre-bloom); 5 = 13 Jun (full bloom); 6 = 21 Jun (1st post-bloom); 7 = 2 Jul.

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

^xPercent control = control of disease severity over that of the water-treated check.

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