

GRAPE (*Vitis vinifera* 'White Riesling')
Powdery Mildew; *Erysiphe necator*

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Efficacy of organic materials for management of grape powdery mildew on Riesling, 2019.

Fungicide treatments were arranged in a randomized complete block design in a vineyard of 'White Riesling' planted in 1995 on a 7x10 ft spacing. Vines were trained to a bilateral cordon with spur pruning. Vines were pruned on 28 to 29 Jan. Sucker removal and shoot thinning by hand occurred 23 to 24 May. Canes were cut above the top wire on 27 Jun 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 148 gal water/A, depending on time of year, such that 2.5 to 4.9 gal of spray suspension was used per 20 vines, depending canopy growth. Fungicides were applied on 27 May (BBCH 53), 3 Jun (BBCH 57), 10 Jun (BBCH 61), 17 Jun (BBCH 68), 24 Jun (BBCH 71), 1 Jul (BBCH 75), and 9 Jul (BBCH 77). Applications were suspended early due to excessively high powdery mildew pressure. No leaves were removed from the fruiting zone and no insecticides were applied during the trial. Makaze (32 fl oz/A) plus Goal 2XL (32 fl oz/A) was applied on 30 Jan and Rely 280 (4 qt/A) was applied on 3 May for management of weeds. Fertilizer (Urea 46-0-0 at 30 lb/A) was applied on 5 Apr, however, that was followed by non-uniform flooding on 9 to 12 Apr with standing water in the block until 17 Apr. 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: 0 severe infection periods, 3 moderate infection periods (18, 21 and 25 May) and 2 low infection periods (14 and 22 May). The risk index briefly shot up from 0 to past 60 then back down to 0 in mid-May, then back above 60 early June before and during bloom, remained high (above 60) until late June when it dropped below 60 for a week during a cool period, then back above 60 until mid Sep. Incidence and severity of powdery mildew was evaluated from 17 to 19 Jul by randomly examining 50 clusters or leaves from the middle 3 vines of each replicate.

Rainfall for the growing season (Oct 2018 to Sep 2019) was approximately 5 inches below the 115 yr average but temperatures were at the average of 59.2°F. March precipitation was 3 in below normal while April was 3 in above normal which led to localized flooding from April 9 to 11 in parts of the vineyard prior to bud break. Symptoms of powdery mildew were first found in nearby blocks on 13 May as a few individual colonies on scattered vines and as flag shoots on 16 May. Disease pressure was high and flooding combined with fast growing grapes resulted in the first application 14 days after finding the first active powdery mildew colonies. All leaves and clusters examined on vines treated only with Aviv had powdery mildew as did non-treated vines. Powdery mildew found on vines treated only with Aviv was not significantly different than powdery mildew found on non-treated vines. Lowest incidence or severity of powdery mildew on leaves was found on vines treated with Microthiol Disperss which was significantly lower than the powdery mildew found in all other treatments. Lowest severity of powdery mildew on clusters was found on vines treated with Microthiol Disperss which was significantly lower than the powdery mildew found in all other treatments. No phytotoxicity was observed on any vines treated with any material.

Treatment & Rate/A or /100 gal water as indicated	Time of Application*	Leaves with Powdery Mildew**		Clusters with Powdery Mildew**	
		Incidence	Severity	Incidence	Severity
Non-treated.....	None.....	100 a	68.0 a	100	100 a
Microthiol Disperss at 5 lb	All.....	67.5 b	3.4 c	100	89.0 b
Instill at 25 fl oz then	A				
Instill at 15 fl oz.....	C, E, and G	100 a	44.7 b	100	100 a
Aviv at 30 fl oz.....	All.....	100 a	63.4 a	100	100 a
Aviv at 30 fl oz alternate with	A, B, C, E, F				
Instill at 15 fl oz or	A				
Instill at 10 fl oz.....	C, and F.....	100 a	40.4 b	100	100 a

* Pesticides were applied on A = 27 May (BBCH 53), B = 3 Jun (BBCH 57), C = 10 Jun (BBCH 61), D = 17 Jun (BBCH 68), E = 24 Jun (BBCH 71), F = 1 Jul (BBCH 75), and G = 9 Jul (BBCH 77).

** Means followed by the same letter do not differ significantly based on Fisher's protected LSD ($P=0.05$). Means without letters are not significantly different.