Fungicide control of Phomopsis cane and leaf spot on grape: 2012 field trial

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Introduction

Phomopsis cane and leaf spot of grapevine is caused by the fungal pathogen, *Phomopsis viticola*. On leaves, the disease is manifest as small dark spots with yellow halos on the leaf blade and veins (Flaherty et al. 1992). Similar spotting can occur on petioles or on the basal portion of infected shoots, and heavy infection on shoots may cause a scab-like appearance (Hewitt and Pearson 1988). Spring rains occurring after budbreak stimulate spore release, dispersal and infection (Gubler et al. 2008). Spores released from overwintering pycnidia on canes and spurs are spread by rain to young shoots. Infection occurs most readily when moisture remains on the green tissue for many hours (Nita et al. 2008).

In California, the disease can be economically important during wet years in the northern coast and in the northern San Joaquin Valley. Economic loss is generally minor, except during years when damage to shoots and fruit reduces the number of fruit clusters. In the northern San Joaquin Valley, susceptible grape varieties include Cabernet Sauvignon, Pinot Noir, Chardonnay, Thompson Seedless, and Grenache (Flaherty et al. 1992). Fungicide applications are made during the spring months to protect shoots.

A field trial was conducted at the UC Davis Plant Pathology Farm in northeastern Solano County, CA to evaluate the efficacy of registered and experimental fungicides on control of Phomopsis cane and leaf spot. The variety Thompson Seedless was used in this study. Two applications were made during Mar/April 2012 prior to precipitation events.

Materials and Methods

The trial was conducted on 3 rows of vines in a 33 year-old Thompson Seedless vineyard (8x12 ft row spacing), using a complete randomized design with 4 replicates. Plots consisted of 3 adjacent vines.. Fungicides were applied with a handgun sprayer (Nifty-Fifty circulating tank) using 75 gallons/acre on 21 Mar and 150 gallons/acre on 2 April. At the time of the first application, shoots were roughly 20 cm in length.

Disease was assessed on 8 June following two rain events by rating disease severity on shoots on each vine by counting the number of infected shoots. Trial models were analyzed using the ANOVA Tests for data; P-values for trial was $P<0.0001$. Means comparisons were made using Fisher's LSD with $\alpha=0.05$.

Table 1. Experimental Design

Experimental design	Complete randomized design with 4 replicates.		
Experimental unit	3 adjacent vines = 1 plot		
Plot area	288 ft^2 (row spacing = 12 ft, vine spacing = 8 ft)		
Area/treatment	1152 ft^2 (5 reps. = 1 treatment)	Area/treatment	0.0264 acre/treatment
Volume water/acre	75 gallons (first spray)= 2 gal/4 replicates 150 gallons (second spray), = 4 gallons/4 replicates		

Table 2. Treatments examined in the trial. FP = formulated product.

Flag	Product(s)	FP/Acre	FP/4 replicate plots
W	Unsprayed control	none	none
Y	Merivon	4 fl oz	3.1 ml
B	Merivon	5.5 fl oz	4.3 ml
Pu	Sovran	4 oz	3.0 g

Results

Two rain events from April to early May (Figure 1) provided wetnesss for *Phomposis* infection on emergent green tissue (Figure 1). The three fungicide treatments, Merivon, 5,5 fl oz, Merivon, 4.0 fl oz and Sovran, 4.0 oz all significantly decreased disease.

Figure 1. Daily mean temperature and precipitation data for Davis, California during the experimental period. Data are from CIMIS station 6 (http://wwwcimis.water.ca.gov/). Arrows indicate fungicide applications.

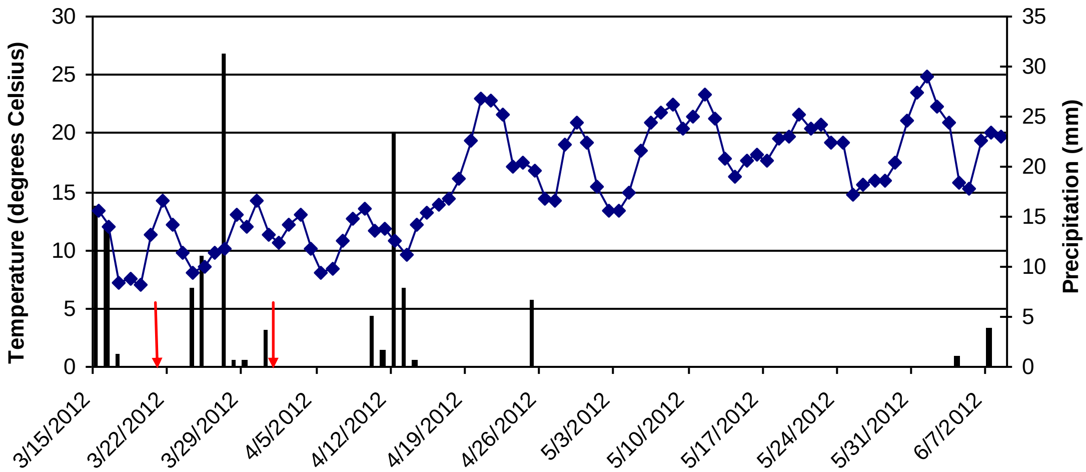

Table 1. Treatment effects on shoot disease symptoms. Treatment means with different letters are significantly different according to the Fisher's LSD test (α = 0.05).

Treatment	Mean No. of shoots infected	Means Comparison
Merivon, 5.5 fl oz	0.67	b
Sovran	1.08	b
Merivon, 4.0 fl oz	1.67	b
Untreated Control	15.00	a

References

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Hewitt WB and Pearson RC. (1988) Phompsis cane and leaf spot. *In:* Compendium of Grape Diseases. Pearson RC and Goheen AC (eds.) APS Press, St. Paul, MN.

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Appendix: Materials

Product	Active ingredient(s) and concentration	Class	Manufacturer
Merivon	fluxapyroxad (21.26%), pyraclostrobin (21.6%)	QoI/SDHI	BASF
Sovran	kresoxim methyl (50%)	QoI	BASF

Appendix references: (1) Adaskaveg, et al. 2012. Efficacy and timing of fungicides, bactericides and biologicals for deciduous tree fruit, nut, strawberry, and vine crops 2012, available at http://www.ipm.ucdavis.edu/PDF/PMG/fungicideefficacytiming.pdf , (2) http://www.omri.org/index.html, (3) Janousek et al. 2011. Grape powdery mildew trials, available at http://plantpathology.ucdavis.edu/ext/gubler/fungtrials2011/, (3) various sources including product labels and/or MSDS.