Grape powdery mildew fungicide Trial 4, 2006

Location	Herzog Ranch, near Courtland, Sacramento Co., California
Principle investigator	Doug Gubler
Research associates	Ken Asay, Chris Janousek, Ph.D.
Cooperators	John, Cathy, and Randy Baranek, Tom Herzog
Crop	Grape, "Chardonnay" variety
Disease	Powdery mildew, *Uncinula necator*

4a. Trial layout and method

Objective	Test the efficacy of fungicides for control of powdery mildew.		
Experimental design	Treatments are field applications to 3 vine plots, in a randomized complete block design, with 4 replicates.		
Application method	High pressure tank sprayers, backpack sprayers.		
Vine spacing	7 ft	Row spacing	11 ft
Treatment unit	3 vines	Treatment unit area	231 ft^2
Area/Treatment	924 ft^2	Area/Treatment	0.021 acres
Volume water/acre	190 gallons 240 gallons 260 gallons	Volume water/Treatment	4.0 gallons 5.0 gallons 5.5 gallons
Application frequency	Variable	Evaluation stage	Veraison

4b. Fungicide treatments

Trt no.	Flag	Institution	Materials	Interval (days)	FP/Acre	FP/Treatment
1	W		Untreated control			
2	PC	BioWorks, Inc.	Milstop	7-10	2.7 lb	26.2 g
3	P	BioWorks, Inc.	Milstop	7-10	5.5 lb	52.5 g
4	O		Milstop alt "A"	7-10 alt 17-21	2.7 lb	26.2 g alt 3.9 ml
5	Pu		"A"	17-21		3.9 ml
6	OYS	Phyton Corp.	Phyton-016-B	14	22 fl oz	13.7 ml
7	LG	Phyton Corp.	Phyton-016-B	14	33 fl oz	20.5 ml

Notes: The treatments described in this report were conducted for experimental purposes only and crops treated in a similar manner may not be suitable for commercial or other use. FP = formulated product; alt = alternated with.

4c. Fungicide information

Institution	Product	Active Ingredient(s)	Concentration(s)	Contact
BioWorks, Inc.	Milstop	potassium bicarbonate	85 %	Randy Martin rmartin@bioworksinc.com
	"A"			
Phyton Corp.	Phyton-016-B	copper sulfate tannic acid	21.36 % 1.08 %	Joleen Perkins

4d. Fungicide applications

Date **Stage** **Volume**	27 May Bloom 190 gal/acre	5 June small grapes 190 gal/acre	9 June 190 gal/acre	12 June pea-sized grapes 240 gal/acre	15 June 190 gal/acre	21 June pea-sized + grapes 190 gal/acre
1	O	O	O	O	O	O
2	X	X			X	
3	X	X			X	
4	X	X				X
5	X			X		
6	X		X			
7	X		X			

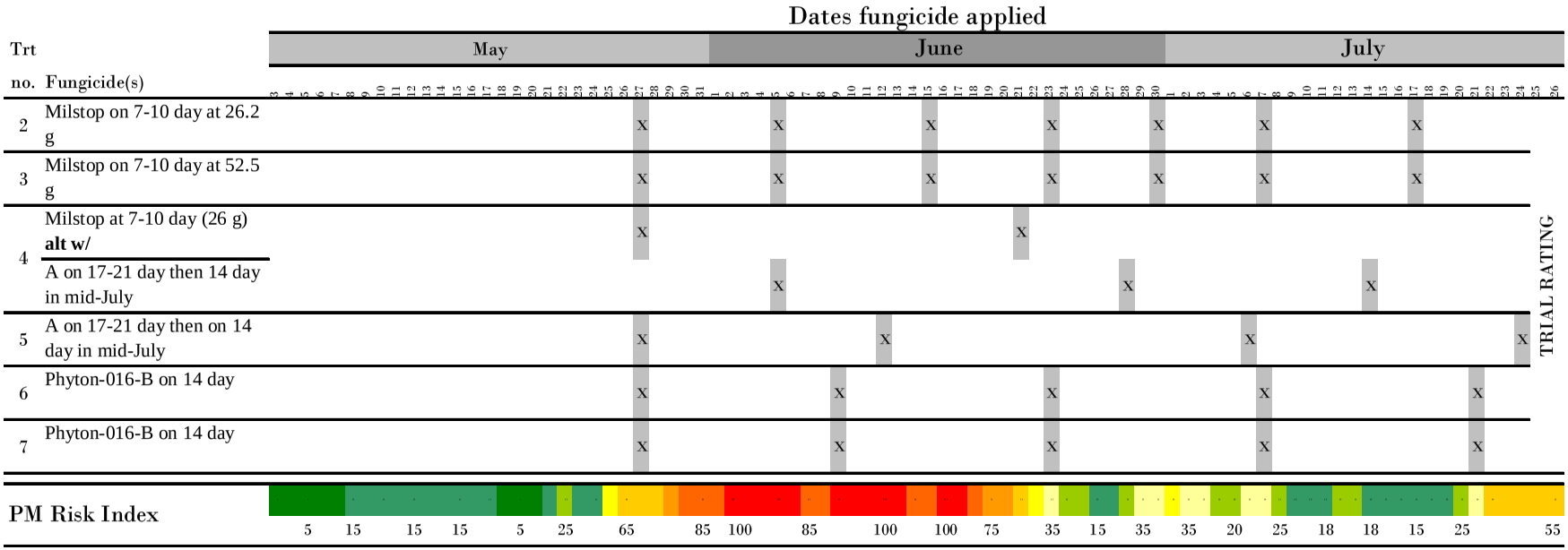
Date **Stage** **Volume**	23 June 190 gal/acre	28 June Small marble size 190 gal/acre	29 June 260 gal/acre	30 June 260 gal/acre	6 July 260 gal/acre	7 July 260 gal/acre
1	O	O	O	O	O	O
2	X			X		X
3	X			X		X
4		X				
5			X		X	
6	X					X
7	X					X

Date **Stage** **Volume**	14 July 260 gal/acre	17 July 260 gal/acre	21 July 260 gal/acre
1	O	O	O
2		X	
3		X	
4	X		
5			X
6			X
7			X

Additional notes on applications:

June 28: Began manual thinning of vines. Finished in approximately one week.

MilStop and Phyton applications



4e. Plot map

Dirt Road

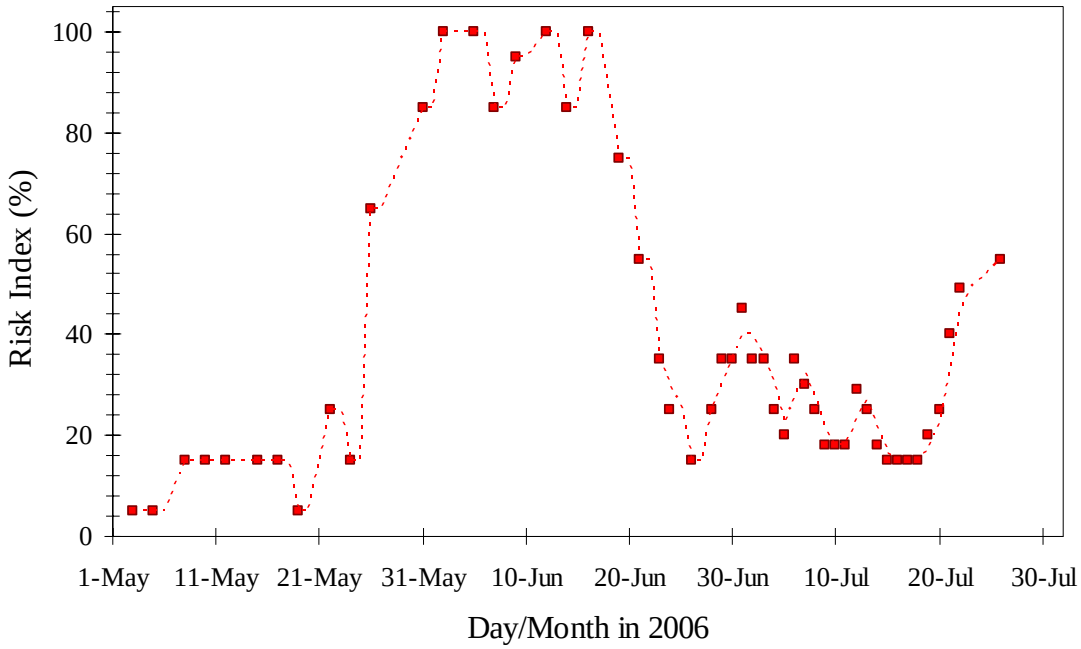
Row 73	Row 72	Row 71	Row 70
OYS	X	**PC**	**LG**
PC	**LG**	**OYS**	**W**
W	**PC**	**O**	**P**
O	**P**	**LG**	**PC**
LG	**Pu**	**W**	**Pu**
Pu	**O**	**P**	**OYS**
P	**W**	**Pu**	**O**
X	**OYS**	X	X
Block 1	**Block 2**	**Block 3**	**Block 4**

Trial I

X = vines not utilized in the experiment.

4f. Herzog Ranch 2006 PM risk index

All risk index data from: www.precisionagrilab.com/Diseasemaps



4g. Results

Table 1. Trial 4 mean powdery mildew severity (±1 S.E.). Non-significant groups of means are represented by the same letter (Tukey-Kramer test). All treatments consisted of 4 replicates.

Treatment description	Disease severity	Significance groups (at $p<0.05$)
Untreated control	100.0 (±0.0)	a
Phyton-016-B, 14 days, 22 fl oz/acre	94.7 (±3.5)	ab
"A", usually 17-21 days	92.8 (±3.0)	ab
Phyton-016-B, 14 days, 33 fl oz/acre	83.7 (±7.3)	bc
Milstop alt "A", 7-10 days	72.7 (±3.6)	cd
Milstop, 7-10 days, 5.5 lbs/acre	36.7 (±2.9)	e
Milstop, 7-10 days, 2.7 lbs/acre	20.5 (±4.5)	e

4h. Conclusions

Fungicide treatments were effective at reducing powdery mildew severity compared to unsprayed control plots, except for “A” applied at 17-21 day intervals and Phyton-016-B applied at 22 fl oz/acre every 14 days. However, most treatments also had rather high disease, a result possibly due to starting this trial late in the season and poor product coverage due to late leaf removal.