

Grape powdery mildew fungicide Trial 3, 2006

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

3a. 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 4-12 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

3b. Fungicide treatments

Trt no.	Flag	Materials	Appl-ications	Interval (days)	FP/Acre	FP/Treat-ment	Notes
1	W	Untreated control	None				
2	Pu	Microthiol (sulfur) Topguard	early ABC...	14	5.5 lb 5.5 fl oz	52.5 g 3.4 ml	Sulfur applied only the 1 st time.
3	OD	Microthiol (sulfur) Topguard	early ABC...	14	5.5 lb 8.7 fl oz	52.5 g 5.5 ml	Sulfur applied only the 1 st time.
4	RKS	Microthiol (sulfur) Topguard	early ABC...	14	5.5 lb 10.9 fl oz	52.5 g 6.8 ml	Sulfur applied only the 1 st time.
5	YC	Microthiol (sulfur) Topguard	early ABC...	14	5.5 lb 21.8 fl oz	52.5 g 13.6 g	Sulfur applied only the 1 st time.
6	RD	Microthiol (sulfur) Topguard alt Sovran	early ACE... BDFG...	14 alt 17	5.5 lb 8.7 fl oz alt 4.4 oz	52.5 g 5.5 ml alt 2.6 g	Sulfur applied only the 1 st time.
7	BS	Microthiol (sulfur) Topguard	early ABC...	10	5.5 lb 5.5 fl oz	52.5 g 3.4 ml	Sulfur applied only the 1 st time.
8	GS	Microthiol (sulfur) Topguard	early ABC...	14	5.5 lb 5.5 fl oz	52.5 g 3.4 ml	Sulfur applied only the 1 st time.
9	KC	Microthiol (sulfur) Topguard	early ABC...	17	5.5 lb 5.5 fl oz	52.5 g 3.4 ml	Sulfur applied only the 1 st time.
10	OKS	Microthiol (sulfur) Topguard	early ABC...	10	5.5 lb 8.7 fl oz	52.5 g 5.5 ml	Sulfur applied only the 1 st time.
11	YKS	Microthiol (sulfur) Topguard	early ABC...	14	5.5 lb 8.7 fl oz	52.5 g 5.5 ml	Sulfur applied only the 1 st time.
12	KS	Microthiol (sulfur) Topguard	early ABC...	17	5.5 lb 8.7 fl oz	52.5 g 5.5 ml	Sulfur applied only the 1 st time.
13	GD	Microthiol (sulfur) Topguard	early ABC...	10	5.5 lb 10.9 fl oz	52.5 g 6.8 ml	Sulfur applied only the 1 st time.
14	OK D	Microthiol (sulfur) Topguard	early ABC...	14	5.5 lb 10.9 fl oz	52.5 g 6.8 ml	Sulfur applied only the 1 st time.
15	YKC	Microthiol (sulfur) Topguard	early ABC...	14	5.5 lb 10.9 fl oz	52.5 g 6.8 ml	Sulfur applied only the 1 st time.
16	RKC	JMS Stylet Oil	ABC...	14	7.2 l	151.4 ml	usually about 1%
17	KD	JMS Stylet Oil alt Quintec	ACE... BDF...	14 alt 21	7.2 l alt 5.5 fl oz	151.4 ml 3.4 ml	usually about 1%
18	OS	Milsana	ABC...	7	3.3 gal	262.8 ml	Applied JMS Stylet Oil several times.
19	RC	Pristine + Latron B-1956	ABC...	21-28 RI	11.5 oz + 436 ml	6.9 g + 9.0 ml	0.06%
20	YRD	Pristine + Latron B-1956	ABC...	21	11.5 oz + 436 ml	6.9 g + 9.0 ml	0.06%

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; RI = powdery mildew risk index.

3c. Materials

Sponsor	Product	Active Ingredient(s)	Concentration	Contact
Cheminova	Microthiol (Sulfur)	sulfur	80 %	Terry Baker tlb.us@cheminova.com
	Topguard	flutriafol	125 g/L SC	
	Sovran	kresoxim methyl	50 %	
JMS Flower Farms	JMS Stylet Oil	mineral oil	99 %	Jeff Simmons styletoil@aol.com
	Quintec	quinoxifen	300 g/L	
WFS	Milsana	<i>Reynoutria sachalinensis</i>	5 %	Jerome Pier jpier@agriumretail.com
BASF	Pristine	pyraclostrobin boscalid	12.8 % 25.2 %	John Helm helmj@basf.com
	Latron B-1956	non-ionic surfactant	77 %	

3d. Fungicide applications

Date	3 May 2006	4 May 2006	5 May 2006	11 May 2006	15 May 2006
Vol	190 gal/acre				
1					
2		X			
3		X			
4	X				
5		X			
6		X			
7		X		X	
8		X			
9		X			
10		X		X	
11		X			
12		X			
13	X			X	
14	X				
15	X				
16	X				
17		X			
18		X			X
19	X				
20	X				

Date	16 May 2006	18 May 2006	19 May 2006	24 May 2006	25 May 2006
Vol	190 gal/acre				
1					
2			X		
3			X		
4			X		
5			X		
6					X
7				X	
8			X		
9					X
10				X	
11			X		
12					X
13				X	
14			X		
15			X		
16	X				
17		X			
18			X	X	
19					
20					

Date	26 May 2006	31 May 2006	1 June 2006	2 June 2006	9 June 2006
Stage					Med to small grapes
Vol	190 gal/acre				
1					
2				X	
3				X	
4				X	
5			X		
6				X	
7				X	
8				X	
9					
10				X	
11				X	
12					
13				X	
14				X	
15				X	
16			X		
17	X				X
18			X		X
19		X			
20	X				

Date	12 June 2006	14 June 2006	15 June 2006	16 June 2006	21 June 2006
Stage	Pea-sized fruits				
Vol	240 gal/acre	190 gal/acre	190 gal/acre	190 gal/acre	190 gal/acre
1					
2		X			
3		X			
4		X			
5		X			
6				X	
7	X				X
8		X			
9	X				
10	X				X
11		X			
12	X				
13	X				X
14		X			
15		X			
16		X			
17					
18			X		X
19					X
20			X		

Date	23 June 2006	28 June 2006	29 June 2006	30 June 2006	3 July 2006
Stage		small marble sized			
Vol	190 gal/acre	190 gal/acre	260 gal/acre	260 gal/acre	260 gal/acre
1					
2		X			
3		X			
4		X			
5			X		
6					X
7				X	
8		X			
9			X		
10				X	
11		X			
12			X		
13				X	
14		X			
15		X			
16		X			
17	X			X	
18			X		
19					
20					

Date	6 July 2006	7 July 2006	11 July 2006	12 July 2006	13 July 2006
Stage				Small marble-size	
Vol	260 gal/acre	260 gal/acre	260 gal/acre	260 gal/acre	260 gal/acre
1					
2				X	
3				X	
4				X	
5					X
6					
7			X		
8				X	
9					
10			X		
11				X	
12					
13			X		
14				X	
15				X	
16				X	
17					
18		X			
19					
20	X				

Date	14 July 2006	15 July 2006	17 July 2006	20 July 2006	21 July 2006
Vol	260 gal/acre				
1					
2					
3					
4					
5					
6				X	
7					X
8					
9	X				
10					X
11					
12	X				
13					X
14					
15					
16					
17	X				
18		X			X
19			X		
20					

Additional notes on applications:

Treatment 18: Initially sprayed with JMS Stylet Oil until June 9th.

24-26 May: Most products applied at 88% of acreage rate.

June 28: Began manual thinning of vines.

June 29: Water was increased from 190 gal/acre to 260 gal/acre.

June 30: Treatment 17-Quintec was accidentally sprayed.

July 7: On treatment 18 plots, 113 ml JMS Stylet Oil was sprayed again.

3e. Plot map

Dirt Road

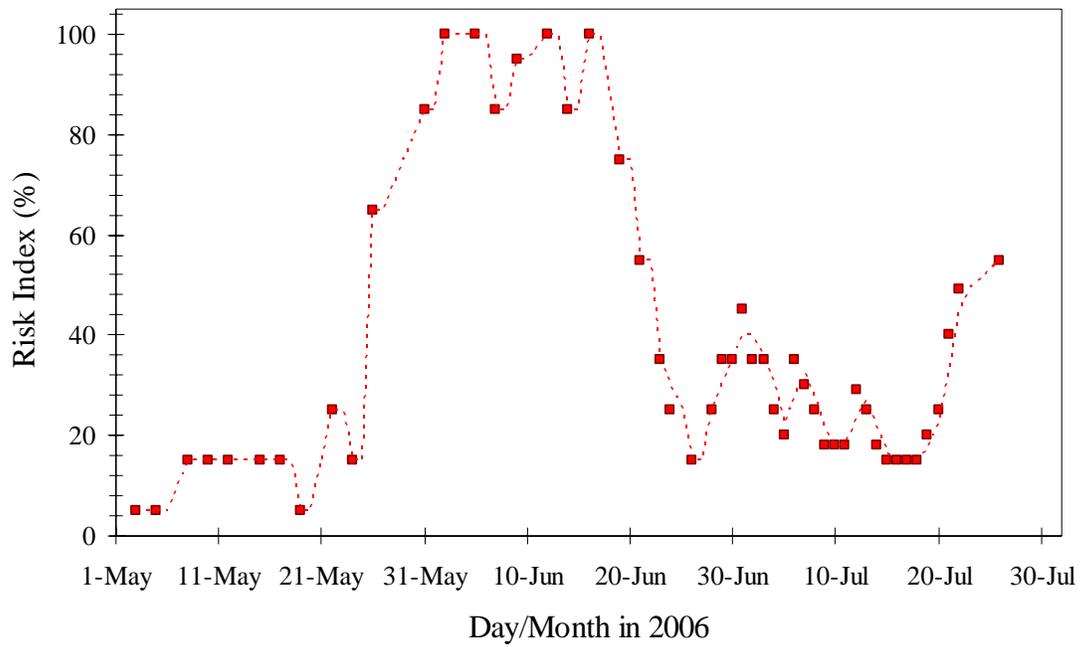
Row 57	Row 56	Row 55	Row 54	Row 53	Row 52	Row 51	Row 50
X	X	X	X	X	X	X	X
YKS	KS	W	YKC	OD	W	YRD	YKC
OKS	GD	KD	RC	GS	YKS	OKS	RD
KC	OKD	BS	OS	BS	KS	W	YKS
GS	YKC	KC	GD	KD	OKS	KS	RKC
BS	RKC	KS	YC	RC	RD	RC	OKD
W	KD	OKD	RKC	RKS	OKD	YC	BS
RD	OS	OKS	RD	YC	GD	Pu	OS
YC	RC	OD	Pu	Pu	YKC	RKS	KD
RKS	YRD	YKS	YRD	RKC	YRD	GD	GS
OD	Pu	GS	RKS	OS	KC	OD	KC
X	X	X	X	X	X	X	X
Block 4		Block 3		Block 2		Block 1	

Grass
Dirt Road
Waterway

X: vines not utilized in the experiment.

3f. Herzog Ranch 2006 PM risk index

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



3g. Results

Table 1. Trial 3 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, except as noted below.

Treatment description	Disease severity	Significance groups (at $p < 0.05$)
Untreated control	99.6 (± 0.4)	a
Topguard, 17 days, 5.5 fl oz/acre	58.3 (± 4.8)	b
JMS Stylet Oil, 14 days	46.2 (± 5.2)	bd
Topguard, 14 days, 8.7 fl oz/acre, n=8	44.0 (± 8.6)	bc
Topguard, 14 days, 5.5 fl oz/acre, n=8	40.8 (± 6.3)	bce
Pristine & Latron, 21 days, 11.5 oz/acre	40.5 (± 8.0)	bce
Topguard alt Sovran, 14 alt 17 days	33.8 (± 5.1)	bcef
Topguard, 17 days, 8.7 fl oz/acre	28.0 (± 3.6)	bceg
Milsana & JMS Stylet Oil mixture, 7 days	16.0 (± 7.3)	degh
Topguard, 14 days, 10.9 fl oz/acre, n=12	7.7 (± 3.4)	gh
Topguard, 10 days, 8.7 fl oz/acre	4.1 (± 1.2)	fgh
JMS Stylet Oil alt Quintec, 14 alt 21 days	3.0 (± 0.8)	gh
Topguard, 10 days, 10.9 fl oz/acre	1.4 (± 0.9)	h
Topguard, 10 days, 5.5 fl oz/acre	1.3 (± 0.6)	h
Topguard, 14 days, 21.8 fl oz/acre	0.6 (± 0.2)	h
Pristine & Latron, 21-28 days, 11.5 oz/acre	0.4 (± 0.4)	h

3h. Conclusions

All treatments demonstrated significantly reduced disease severity relative to untreated plots. In general, Topguard (flutriafol) applied at high frequency (e.g., 10 days) or at higher concentrations, but lower frequency (14 days), provided good control of powdery mildew. All 10 day flutriafol treatments kept PM levels below 5% and were significantly better than the 17 day, 5.5 fl oz/acre, the 14 day, 8.7 fl oz/acre, and the 14 day, 5.7 fl oz/acre treatments. JMS Stylet Oil used alone only reduced PM cover to 46%. This was the result of poor coverage.