

Cooperative Research Project, Doug Gubler, U.C. Davis Dept. of Plant Pathology

Trial name.....	Grape powdery mildew fungicide Trial 2, 2003
Location.....	Courtland, Sacramento Co. (Herzog Ranch)
Investigators.....	Doug Gubler, 530.752.0304; Ken Dell, Eugene Erickson 752.4982
Cooperators.....	John Baranek, Tom Herzog
Crop.....	Grape 'Chardonnay'
Disease.....	Powdery mildew, <i>Uncinula necator</i>

Trial 2 layout and method

Objective.....	Efficacy of fungicides for control of powdery mildew		
Experimental design	Treatments are field applications to 4 vine plots, in a randomized complete block design, with 4 replications.		
Application method	high pressure hand gun sprayer		
Vine spacing	7'	Row spacing.....	12'
Treatment unit.....	4 vines	Treatment unit area.....	336 ft ²
Area/Treatment, sq ft ...	1344	Area/Treatment, acre	0.0308539
Vol. Water/acre, gal.....	138	Vol. water/trt, gal.....	4.25
Apps timing	A=shoot growth, B = pre-bloom; C=bloom, D=berry set, E=preclose, F,G=veraison		
		Evaluation stage.....	1 week after final app.

Treatments protocol, Trial 2

#	Color	Sponsor	Materials	App code	Interval	FP/A		Tol
1	W	Lab	Untreated					Y
2	GD	Lab	Sulfur DF Abound 2.08F	A B-G	7-10d 14d	4.0 15.4	lb foz	Y
3	W / G	Emero USA	Sulfur DF Flint 50WG EM-1	A1-3 B C	7-10d 14d 7d	4.0 1.5 0.8	lb oz %	Y
4	B	Dow	Sulfur DF Quintec 250SC	A1-3 B-G	7-10d 14d	4.0 4.0	lb foz	N
5	Y / BK	Dow	Sulfur DF Quintec 250SC	A1-3 B-G	7-10d 21d	4.0 6.0	lb foz	N
6	P	Dow	Sulfur DF Rally 40W alt w/ Quintec 250SC	A1-3 BDF CEG	7-10d 14d 14d	4.0 4.0 4.0	lb oz foz	N
7	PU	Dow	Sulfur DF Rally 40W alt w/ Quintec 250SC	A1-3 BDF CEG	7-10d 21d 21d	4.0 5.0 6.0	lb oz foz	N
8	L	Dow	Sulfur DF Rally 40W Quintec 250SC Rally 40W Quintec 250SC	A1-3 B CD E FG	7-10d 14d 14d 14d 14d	4.0 4.0 4.0 4.0 4.0	lb oz foz oz foz	N
9	R	Dow	Sulfur DF Rally 40W Quintec 250SC Rally 40W Quintec 250SC	A1-3 B CD E FG	7-10d 21d 21d 21d 21d	4.0 4.0 6.0 5.0 6.0	lb oz foz oz foz	N
10	OD	Dow	Sulfur DF Quintec 250SC	A1-3 B-G	7-10d 14-21d	4.0 4.0	lb foz	N
11	O / BK	Dow	Sulfur DF Quintec 250SC	A1-3 B-G	7-10d 21-35d	4.0 5.0	lb foz	N

12	BKD	Gowan	Sulfur DF Sovran 50WG Rubigan 1EC+ Latron B-1956	A1-3 B C D EF	7-10d 14d RI 14d RI 14d RI 14d RI	4.0 3.2 3 4 6 5.5	lb oz foz foz foz foz	Y
13	W / BK	Gowan	Sulfur DF Sovran 50WG GWN-4350 + Latron B-1956	A1-3 B C D EFG	7-10d 14d RI 14d RI 14d RI 14d RI	4.0 3.2 4 5 7 5.5	lb oz foz foz foz foz	Y
14	BD	Gowan	Sulfur DF Sovran 50WG Rubigan 1EC + Latron B-1956	A1-3 B C-G	7-10d 14d RI 14d RI	4.0 3.2 3 5.5	lb oz foz foz	Y
15	BBKD	Gowan	Sulfur DF Sovran 50WG Rubigan 1EC + Latron B-1956	A1-3 BD C EFG	7-10d 14d RI 14d RI 14d RI	4.0 3.2 4 6 5.5	lb oz foz foz foz	Y
16	OC	Lab	Sulfur DF Sovran 50WG	A1-3 BC	7-10d 14d	4.0 3.2	lb oz	Y
17	YBKC	Lab	Sulfur DF Sovran 50WG	A1-3 B-D	7-10d 14d	4.0 3.2	lb oz	Y
18	OBKD	Lab	Sulfur DF Sovran 50WG	A1-3 B-E	7-10d 14d	4.0 3.2	lb oz	Y
19	W / B	Lab	Sulfur DF Sovran 50WG	A1-3 B-F	7-10d 14d	4.0 3.2	lb oz	Y
20	W / O	Lab	Sulfur DF Sovran 50WG	A1-3 B-G	7-10d 14d	4.0 3.2	lb oz	Y
21	YBKD	Canada	Sulfur DF Sovran Oil	A1,2 A3,BEF CDGH	7-10d 14d 7-10d	4.0 3.2 1.5	lb oz %	Y
22	BC, BC2a, BC4a	Emero USA	Untreated EM-1	AB C-G	7d	0.8	%	Y

Notes:

1. Tol indicates whether all products in the treatment have an EPA tolerance for grapes, and the crop can be harvested.
2. A slash '/' in a sequence of materials means 'followed by'.

Materials list

Sponsor	Product	Active Ingr.	Conc.	Tol.	Mfr
Lab	Sulfur 80DF Abound 2.08F Flint 50WG Elite 45DF	Sulfur Azoxystrobin Trifloxystrobin Tebuconazole	80% 300 g/L 50% 45%	Y Y Y Y	Wilbur-Ellis Syngenta Bayer Bayer
Dow Agro	Sulfur 80DF Quintec 250SC Abound 2.08F	Sulfur Quinoxifen Azoxystrobin	80% 25 g/L 300 g/L	Y N Y	Wilbur-Ellis Dow Agro Syngenta
Gowan	Sulfur 80DF Rubigan 1EC GWN-4350	Sulfur Fenarimol	80% 1 lb/gal	Y Y N	Wilbur-Ellis Gowan Gowan

Canada	Sulfur DF Oil Sovran 50WG	Sulfur Petroleum oil Kresoxim methyl	80% 50%	Y N Y	Wilbur-Ellis Petro Canada BASF
EmeroUSA	EM-1	Biologicals			

Application schedule

Date App.# Stage Vol/trt Color	Trt#	4 Apr 03 A1 Pre-bloom 4.25 gal	FP/trt	15 Apr 03 A2 Pre-bloom 4.25 gal	FP/trt	29 Apr 03 A3 Pre-bloom 4.25 gal	FP/trt	8 May 03 A4 BBCH 57 4.25 gal	FP/trt
W	1	-----		-----		-----		-----	
GD	2	Sulfur dust Sulfur DF	56 g	Sulfur dust Sulfur DF	56 g	Sulfur DF	56 g	Sulfur DF	56 g
W / G	3	Sulfur dust Sulfur DF	56 g	Sulfur dust Sulfur DF	56 g	Sulfur DF	56 g	Sulfur DF	56 g
B	4	Sulfur dust Sulfur DF	56 g	Sulfur dust Sulfur DF	56 g	Sulfur DF	56 g	Sulfur DF	56 g
Y /BK	5	Sulfur dust Sulfur DF	56 g	Sulfur dust Sulfur DF	56 g	Sulfur DF	56 g	Sulfur DF	56 g
P	6	Sulfur dust Sulfur DF	56 g	Sulfur dust Sulfur DF	56 g	Sulfur DF	56 g	Sulfur DF	56 g
PU	7	Sulfur dust Sulfur DF	56 g	Sulfur dust Sulfur DF	56 g	Sulfur DF	56 g	Sulfur DF	56 g
L	8	Sulfur dust Sulfur DF	56 g	Sulfur dust Sulfur DF	56 g	Sulfur DF	56 g	Sulfur DF	56 g
R	9	Sulfur dust Sulfur DF	56 g	Sulfur dust Sulfur DF	56 g	Sulfur DF	56 g	Sulfur DF	56 g
OD	10	Sulfur dust Sulfur DF	56 g	Sulfur dust Sulfur DF	56 g	Sulfur DF	56 g	Sulfur DF	56 g
O /BK	11	Sulfur dust Sulfur DF	56 g	Sulfur dust Sulfur DF	56 g	Sulfur DF	56 g	Sulfur DF	56 g
BKD	12	Sulfur dust Sulfur DF	56 g	Sulfur dust Sulfur DF	56 g	Sulfur DF	56 g	Sulfur DF	56 g
W /BK	13	Sulfur dust Sulfur DF	56 g	Sulfur dust Sulfur DF	56 g	Sulfur DF	56 g	Sulfur DF	56 g
BD	14	Sulfur dust Sulfur DF	56 g	Sulfur dust Sulfur DF	56 g	Sulfur DF	56 g	Sulfur DF	56 g
BBKD	15	Sulfur dust Sulfur DF	56 g	Sulfur dust Sulfur DF	56 g	Sulfur DF	56 g	Sulfur DF	56 g
OC	16	Sulfur dust Sulfur DF	56 g	Sulfur dust Sulfur DF	56 g	Sulfur DF	56 g	Sulfur DF	56 g
YBKC	17	Sulfur dust Sulfur DF	56 g	Sulfur dust Sulfur DF	56 g	Sulfur DF	56 g	Sulfur DF	56 g
OBKD	18	Sulfur dust Sulfur DF	56 g	Sulfur dust Sulfur DF	56 g	Sulfur DF	56 g	Sulfur DF	56 g
W / B	19	Sulfur dust Sulfur DF	56 g	Sulfur dust Sulfur DF	56 g	Sulfur DF	56 g	Sulfur DF	56 g
W / O	20	Sulfur dust Sulfur DF	56 g	Sulfur dust Sulfur DF	56 g	Sulfur DF	56 g	Sulfur DF	56 g
YBKD	21	Sulfur dust Sulfur DF	56 g	Sulfur dust Sulfur DF	56 g	Sovran 50WG	2.8 g		
BC	22	Sulfur dust Sulfur DF	56 g	Sulfur dust Sulfur DF	56 g	-----		-----	

Date App.# Stage Vol/trt Color	Trt#	13 May 03 B BBCH 57 4.25 gal	FP/trt	16 May 03 B BBCH 57-61 4.25 gal	FP/trt	23 May 03 C BBCH 67 4.25 gal	FP/trt	30 May 03 C BBCH 69 4.25 gal	FP/trt
W	1	----		----		----		----	
GD	2			Abound 2.08F	15 mL			Abound 2.08F	15 mL
W / G	3			Flint 50WG	1.3 g			EM-1	128 mL
B	4			Quintec 250SC	3.7 mL			Quintec 250SC	3.7 mL
Y /BK	5			Quintec 250SC	5.5 mL				
P	6			Rally 40W	3.5 g			Quintec 250SC	3.7 mL
PU	7			Rally 40W	4.3 g				
L	8			Rally 40W	3.5			Quintec 250SC	3.7 mL
R	9			Rally 40W	3.5				
OD	10			Quintec 250SC	3.7 mL			Quintec 250SC	3.7 mL
O /BK	11			Quintec 250SC	4.6 mL				
BKD	12			Sovran 50WG	2.8 g			Rubigan 1EC + Latron B-1956	3.0 g 5.0 mL
W /BK	13			Sovran 50WG	2.8 g			GWN-4350 + Latron B-1956	3.9 mL 5.0 mL
BD	14			Sovran 50WG	2.8 g			Rubigan 1EC + Latron B-1956	3.0 g 5.0 mL
BBKD	15			Sovran 50WG	2.8 g			Rubigan 1EC + Latron B-1956	3.9 g 5.0 mL
OC	16			Sovran 50WG	2.8 g			Sovran 50WG	2.8 g
YBKC	17			Sovran 50WG	2.8 g			Sovran 50WG	2.8 g
OBKD	18			Sovran 50WG	2.8 g			Sovran 50WG	2.8 g
W / B	19			Sovran 50WG	2.8 g			Sovran 50WG	2.8 g
W / O	20			Sovran 50WG	2.8 g			Sovran 50WG	2.8 g
YBKD	21	Sovran 50WG	2.8 g			Canada Oil	242 mL		
BC	22	----		----				EM-1	128 mL

Date App.# Stage Vol/trt Color	Trt#	3 Jun 03 D BBCH 71 4.25	FP/trt	5 Jun 03 D BBCH 71 4.25 gal	FP/trt	10 Jun 03 D BBCH 71-73 4.25 gal	FP/trt	12 Jun 03 D BBCH 71-73 4.25 gal	FP/trt
W	1	----		----		----		----	
GD	2								
W / G	3			EM-1	128 mL			EM-1	128 mL
B	4								
Y /BK	5			Quintec 250SC	5.5 mL				
P	6								
PU	7			Quintec 250SC	5.5 mL				
L	8								
R	9			Quintec 250SC	5.5 mL				
OD	10								
O /BK	11			Quintec 250SC	4.6 mL				
BKD	12								
W /BK	13								
BD	14								
BBKD	15								
OC	16								
YBKC	17								
OBKD	18								
W / B	19								
W / O	20								
YBKD	21	Canada Oil	242 mL			Sovran 50WG	2.8 g		
BC	22			EM-1	128 mL			EM-1	128 mL

Date App.# Stage Vol/trt Color	Trt#	13 Jun BBCH 73-75 4.25 gal	FP/trt	19 Jun BBCH 77 4.25 gal	FP/trt	24 Jun BBCH 77-79 4.25 gal	FP/trt	26 Jun BBCH 79 4.25 gal	FP/trt
W	1	----		----		----		----	
GD	2	Abound 2.08F	15 mL						
W / G	3			EM-1	128 mL			EM-1	128 mL
B	4	Quintec 250SC	3.7 mL						
Y /BK	5							Quintec 250SC	5.5 mL
P	6	Rally 40W	3.5 g						
PU	7							Rally 40W	4.3 g
L	8	Quintec 250SC	3.7 mL						
R	9							Quintec 250SC	5.5 mL
OD	10	Quintec 250SC	3.7 mL						
O /BK	11							Quintec 250SC	4.6 mL
BKD	12	Rubigan 1EC Latron B-1956	3.9 mL 5.0 mL						
W /BK	13	GWN-4350 Latron B-1956	4.9 mL 5.0 mL						
BD	14	Rubigan 1EC + Latron B-1956	3.0 mL 5.0 mL						
BBKD	15	Sovran 50WG	2.8 g						
OC	16								
YBKC	17	Sovran 50WG	2.8 g						
OBKD	18	Sovran 50WG	2.8 g						
W / B	19	Sovran 50WG	2.8 g						
W / O	20	Sovran 50WG	2.8 g						
YBKD	21					Sovran 50WG	2.8 g		
BC	22			EM-1	128 mL			EM-1	128 mL

Date	App.#	Stage	Vol/trt	Color	Trt#	27 Jun F BBCH 79 4.25 gal	FP/trt	3 Jul F BBCH 79 4.25 gal	FP/trt	8 Jul F BBCH 79 4.25 gal	FP/trt	10 Jul F BBCH 79 4.25 gal	FP/trt
W	1				1	----		----		----		----	
GD	2				2	Abound 2.08F	15 mL						
W / G	3				3			EM-1	128 mL			EM-1	128 mL
B	4				4	Quintec 250SC	3.7 mL						
Y /BK	5				5								
P	6				6	Quintec 250SC	3.7 mL						
PU	7				7								
L	8				8	Rally 40W	3.5 g						
R	9				9								
OD	10				10	Quintec 250SC	3.7 mL						
O /BK	11				11								
BKD	12				12	Rubigan 1EC Latron B-1956	5.5 mL 5.0 mL						
W /BK	13				13	GWN-4350 Latron B-1956	6.4 mL 5.0 mL						
BD	14				14	Rubigan 1EC Latron B-1956	2.7 mL 5.0 mL						
BBKD	15				15	Rubigan 1EC Latron B-1956	5.5 mL 5.0 mL						
OC	16				16								
YBKC	17				17								
OBKD	18				18	Sovran 50WG	2.8 g						
W / B	19				19	Sovran 50WG	2.8 g						
W / O	20				20	Sovran 50WG	2.8 g						
YBKD	21				21					Canada Oil	242 mL		
BC	22				22			EM-1	128 mL			EM-1	128 mL

Date App.# Stage Vol/trt Color	Trt#	11 Jul F BBCH 79 4.25 gal	FP/trt	15 Jul F BBCH 79 4.25 gal	FP/trt	17 Jul F BBCH 81 4.25 gal	FP/trt	18 Jul F BBCH 81 4.25 gal	FP/trt
W	1	----		----		----		----	
GD	2	Abound 2.08F	15 mL						
W / G	3					EM-1	128 mL		
B	4	Quintec 250SC	3.7 mL						
Y /BK	5					Quintec 250SC	5.5 mL		
P	6	Rally 40W	3.5 g						
PU	7					Quintec 250SC	5.5 mL		
L	8	Quintec 250SC	3.7 mL						
R	9					Rally 40W	4.3 g		
OD	10							Quintec 250SC	3.7 mL
O /BK	11								
BKD	12			Rubigan 1EC	5.5 mL				
				Latron B-1956	5.0 mL				
W /BK	13			GWN-4350	6.4 mL				
				Latron B-1956	5.0 mL				
BD	14			Rubigan 1EC	2.7 mL				
				Latron B-1956	5.0 mL				
BBKD	15			Rubigan 1EC	5.5 mL				
				Latron B-1956	5.0 mL				
OC	16								
YBKC	17								
OBKD	18								
W / B	19	Sovran 50WG	2.8 g						
W / O	20	Sovran 50WG	2.8 g						
YBKD	21							Canada Oil	242 mL
BC	22					EM-1	128 mL		

Date App.# Stage Vol/trt Color	Trt#	24 Jul F BBCH 81 4.25 gal	FP/trt	25 Jul F BBCH 83 4.25 gal	FP/trt		FP/trt		FP/trt
W	1	----		----		----		----	
GD	2			Abound 2.08F	15 mL				
W / G	3	EM-1	128 mL						
B	4			Quintec 250SC	3.7 mL				
Y /BK	5								
P	6			Quintec 250SC	3.7 mL				
PU	7								
L	8			Quintec 250SC	3.7 mL				
R	9								
OD	10								
O /BK	11	Quintec 250SC	4.6 ml						
BKD	12								
W /BK	13								
BD	14								
BBKD	15								
OC	16								
YBKC	17								
OBKD	18								
W / B	19								
W / O	20			Sovran 50WG	2.8 g				
YBKD	21			Sovran 50WG	2.8 g				
BC	22	EM-1	128 mL						

Calendar of events

Date	Activity
	Sulfur dust applied by grower on rows 24, 25
4 Apr 03	KD,EE; sulfur rows 22,23; 4:00-5:30PM, clear, 65F, calm, shoots 6"-10", 4.25gal/trt at 200 psi with #5 ceramic nozzle.
	Sulfur dust applied by grower on rows 24, 25
14 Apr	KD, EE; sulfur rows 22, 23; 10:00AM-3:00PM, 62-65F, 5-10 mph west breeze, PC-overcast, BBCH 1-5, 8"-14" shoots, same spray parameters as previous
15 Apr	KD, EE; sulfur rows 24, 25; 10AM-12N, 62F, 5-15 mph westerly breeze, BBCH 1-5, 8"-14" shoots
23 Apr	Grower-applied sulfur dust to new guard rows #26, 27; flagged Trial 2
24 Apr	Rain; postponed spraying
28 Apr	Rain; postponed spraying
29 Apr	'A3'; KD, EE; 7:30-10:15AM; 55-60F, 0-10 mph south breeze; partly overcast, shoot 10"-14", sprinkles began at 11:40AM; sulfur guard rows 26, 27 except NE half of row 27
8 May	'A4'; KD, EE; 7:30-10:00AM; 50-55F, 0-5 mph west breeze; overcast; BBCH 57
13 May	'B'; KD, EE; 10:00-10:15AM; 70F, calm to 5 mph north breeze; clear; BBCH 57
16 May	'B'; KD, EE; 10:00AM-12:30PM; 70-74F; calm to 5 mph N breeze; clear to high clouds; BBCH 57-61
20 May	'C'; KD, EE; 10:45-11:00 AM; 80F; clear, slight W breeze; BBCH 61-69 (avg 67)
30 May	'C'; KD, EE; 10:00-12:00; 68-72F; overcast, calm; BBCH 69 avg
3 Jun	'D'; KD, EE; 1:00-1:15PM; 84F; clear, 8 mph W breeze; BBCH 71
5 Jun	'D'; KD, EE; 8:00AM-12:00N; 66-74F; clear, 5-10 mph W breeze; BBCH 71
10 Jun	'D'; EE; 1:45-2:00PM; 75F; clear, 5-10 mph W wind; BBCH 71-73
12 Jun	'D' EE, BE; 12:45-1:15PM; 75F; clear, 5-10 mph W wind; BBCH 71-73
13 Jun	KD, EE; 7:30-9:15AM; 62-74F; clear, 5-10 mph SW breeze; BBCH 73-77 (mostly 73-75)
19 Jun	KD, EE; 9:15-9:30AM; 66F; clear, 10-15 mph W wind; BBCH 75-79 (mostly 77)
23 Jun	'F'; KD, EE; 11:30AM-12:30PM; 70F; clear, 5-10 mph NW breeze; BBCH 77-79; sprayed all skipped vines w/ 2% Stylet Oil + Flint (1.5 oz/A)
24 Jun	'F'; KD, EE; 9:45-10:00AM; 70F; clear, 5-10 mph N wind; BBCH 77-79
26 Jun	'F'; EE, JO; 7:00-8:30AM; 68-70F; clear, calm; BBCH 79
27 Jun	'F'; KD, EE; 7:15-8:15AM; 68-72F; clear, calm; BBCH 79
3 Jul	'F'; EE, PO; 6:30-6:45AM; 65F; clear, calm; BBCH 79
8 Jul	'F'; EE, PO; 7:30-7:45AM; 66F; clear, 5-10 mph W wind; BBCH 79
10 Jul	'F'; EE, PO; 7:15-7:30AM; 64F, clear, calm; BBCH 79
11 Jul	'F'; EE, KD; 8:15-9:00AM; 64-68F; clear, calm; BBCH 79
15 Jul	'F'; EE; 8:45-9:30AM; 68F; clear, 5-10mph breeze; BBCH 79
17 Jul	'F'; EE, PO; 10:00AM-1:00PM; 72-90F; clear, calm-5 mph W breeze; BBCH 81
18 Jul	'F'; EE; 7:30-8:00AM; 68F; clear, calm; BBCH 81
24 Jul	'F'; EE, PO; 7:15-7:45AM; 68F; overcast; BBCH 81-83
25 Jul	'F'; EE, PO; 7:30-8:30AM; 66-68F; clear BBCH 83
29 Jul	Lab rate; 7.5 brix
28-29 Aug	EE; crop drop: B, P, L, R, PU, OD, Y/BK, O/BK (Quintec)
9 Sep	EE; map bad vines for next season; remove flagging tape

Trial 2 treatment results- full season applications

Note: Applications are listed in alphabetical sequence, and each letter corresponds to one application.

#	Color	Materials	Application	Severity, %	Incidence, %
10	OD	Sulfur DF, 4 lb.....	ABCD		
		Quintec 250SC, 4 foz	EFGHI.....	0.6 h	30.0 h
4	B	Sulfur DF, 4 lb.....	ABCD		
		Quintec 250SC, 4 foz	EFGHIJ.....	0.7 h	31.3 h
5	Y/BK	Sulfur DF, 4 lb.....	ABCD		
		Quintec 250SC, 6 foz	EFGH.....	0.9 gh	39.4 gh
6	P	Sulfur DF, 4 lb.....	ABCD		
		Rally 40W, 4 foz	EGI		
		Quintec 250SC, 4 foz	FH.....	1.8 fgh	61.3 ef
20	W/O	Sulfur DF, 4 lb.....	ABCD		
		Sovran 50WG, 3.2 oz	EFGHIJ.....	1.8 fgh	57.5 fg
11	O/BK	Sulfur DF, 4 lb.....	ABCD		
		Quintec 250SC, 5 foz	EFGH.....	2.4 efg	70.0 def
8	L	Sulfur DF, 4 lb.....	ABCD		
		Rally 40W, 4 oz	EH		
		Quintec 250SC, 4 foz	FGIJ.....	3.4 def	70.6 cdef
2	GD	Sulfur DF, 4 lb.....	ABCD		
		Abound 2.08F, 15.4 foz	EFGHIJ.....	4.3 cdef	81.9 abcd
13	W/BK	Sulfur DF, 4 lb.....	ABCD		
		Sovran 50WG, 3.2 oz	E		
		GWN-4350, 4 foz + Latron, 5.5 foz	FGHI.....	4.9 cde	82.5 abcd
14	BD	Sulfur DF, 4 lb.....	ABCD		
		Sovran 50WG, 3.2 oz	E		
		Rubigan 1EC, 3 foz + Latron, 5.5 foz	FGHI.....	5.2 cde	79.4 bcde
15	BBKD	Sulfur DF, 4 lb.....	ABCD		
		Sovran 50WG, 3.2 oz	EG		
		Rubigan 1EC, 4 foz + Latron, 5.5 foz	FHI.....	5.4 cde	82.5 abcd
21	YBKD	Sulfur DF, 4 lb.....	AB		
		Sovran, 3.2 oz	CDGHK		
		Oil, 1.5%	EFIJ.....	5.7 cde	76.3 bcdef
9	R	Sulfur DF, 4 lb.....	ABCD		
		Rally 40W, 4 oz	E		
		Quintec 250SC, 6 foz	FG		
		Rally 40W, 5 oz	H.....	7.4 cd	89.4 abcd
12	BKD	Sulfur DF, 4 lb.....	ABCD		
		Sovran 50WG, 3.2 oz	E		
		Rubigan 1EC, 3 foz + Latron, 5.5 foz.....	FGHI.....	8.0 cd	91.9 ab
7	PU	Sulfur DF, 4 lb.....	ABCD		
		Rally 40W, 5 oz	EG		
		Quintec 250SC, 6 foz	FH.....	8.1 c	90.0 abc
3	W/G	Sulfur DF, 4 lb.....	ABCD		
		Flint 50WG, 1.5 oz.....	E		
		EM-1, 0.8%.....	FGHIJKLM.....	24.6 b	100 a
22	BC(a)	Sulfur DF, 4 lb.....	AB		
		Untreated.....	CD		
		EM-1, 0.8%.....	EFGHIJKLM.....	72.1 a	100 a
1	W	Untreated.....		93.2 a	100 a

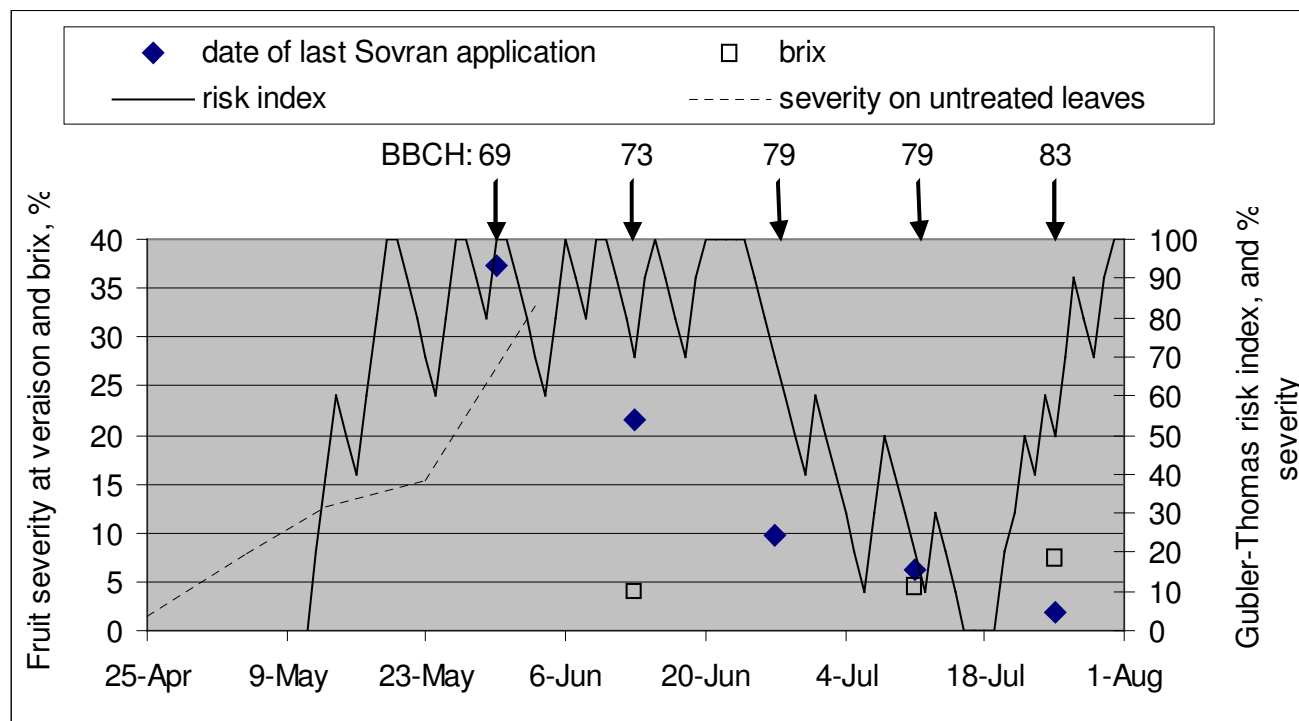
Severity values were log(Y+1) transformed prior to statistical analysis due to heterogeneity of variance; values shown are back-transformed. Values in a column followed by the same letter are not significantly different according to Fisher's LSD t test, P=0.05.

Trial 2 treatment results- staggered cutoff applications

Note: Applications are listed in alphabetical sequence, and each letter corresponds to one application.

#	Color	Materials	Application	Severity, %	Incidence, %
20	W/O	Sulfur DF, 4 lb..... Sovran 50WG, 3.2 oz	ABCD EFGHIJ.....	1.9 c	57.5 b
2	GD	Sulfur DF, 4 lb Abound 2.08F, 15.4 foz	ABCD EFGHIJ.....	4.6 c	81.9 a
19	W/B	Sulfur DF, 4 lb..... Sovran 50WG, 3.2 oz	ABCD EFGHI.....	6.2 c	80.0 a
18	OBKD	Sulfur DF, 4 lb..... Sovran 50WG, 3.2 oz	ABCD EFGH.....	9.8 c	80.6 a
17	YBKC	Sulfur DF, 4 lb..... Sovran 50WG, 3.2 oz	ABCD EFG	21.6 bc	88.8 a
16	OC	Sulfur DF, 4 lb..... Sovran 50WG, 3.2 oz	ABCD EF	37.3 b	100.0 a
1	W	Untreated		93.8 a	100.0 a

Figure 1. Powdery mildew relationship to duration of fungicide application.



BBCH scale: 69=end of flowering; 73=berries groat sized, bunches begin to hang; 75=berries pea size, bunches hang; 79=bunch close; 83=berries begin to brighten in color.