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Fungicide control of pear scab: 2013 field trial

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Summary

Materials and Methods

A. Trial layout

Experimental unit	1 tree = 1 plot				
Row and tree spacing	ft (row) and ft (tree)	Plot unit area	200 ft ²		
Area/treatment	800 ft ² or 0.0184 acre/treatment (4 replicate trees = 1 treatment)				
Fungicide applications	A	bloom	22 Mar	100 gallons/acre	1.8 gallons/4 replicates
	B		5 Apr	100 gallons/acre	1.8 gallons/4 replicates
	C		17 Apr	125 gallons/acre	2.3 gallons/4 replicates
	D		1 May	125 gallons/acre	2.3 gallons/4 replicates

B. Trial Map

Pear Scab 2013 Map

● = skipped tree

								Y
							B	GKD
							RKD	KS
						W	LG	RKS
					OC	PKS	OS	W
				OS	●	●	B	OC
				Y	LG	●	O	PKS
		Y	KS	KS	GKD	RKD	●	OS
		O	LG	RKD	●	BS	Y	●
	B	●	RKS	PKS	O	LG	●	●
	BS	GKD	PKS	BS	W	RKS	KS	O
W	OC	OS	RKD	B	RKS	GKD	OC	BS
1	2	3	4	5	6	7	8	9

Pear Scab Treatments 2013

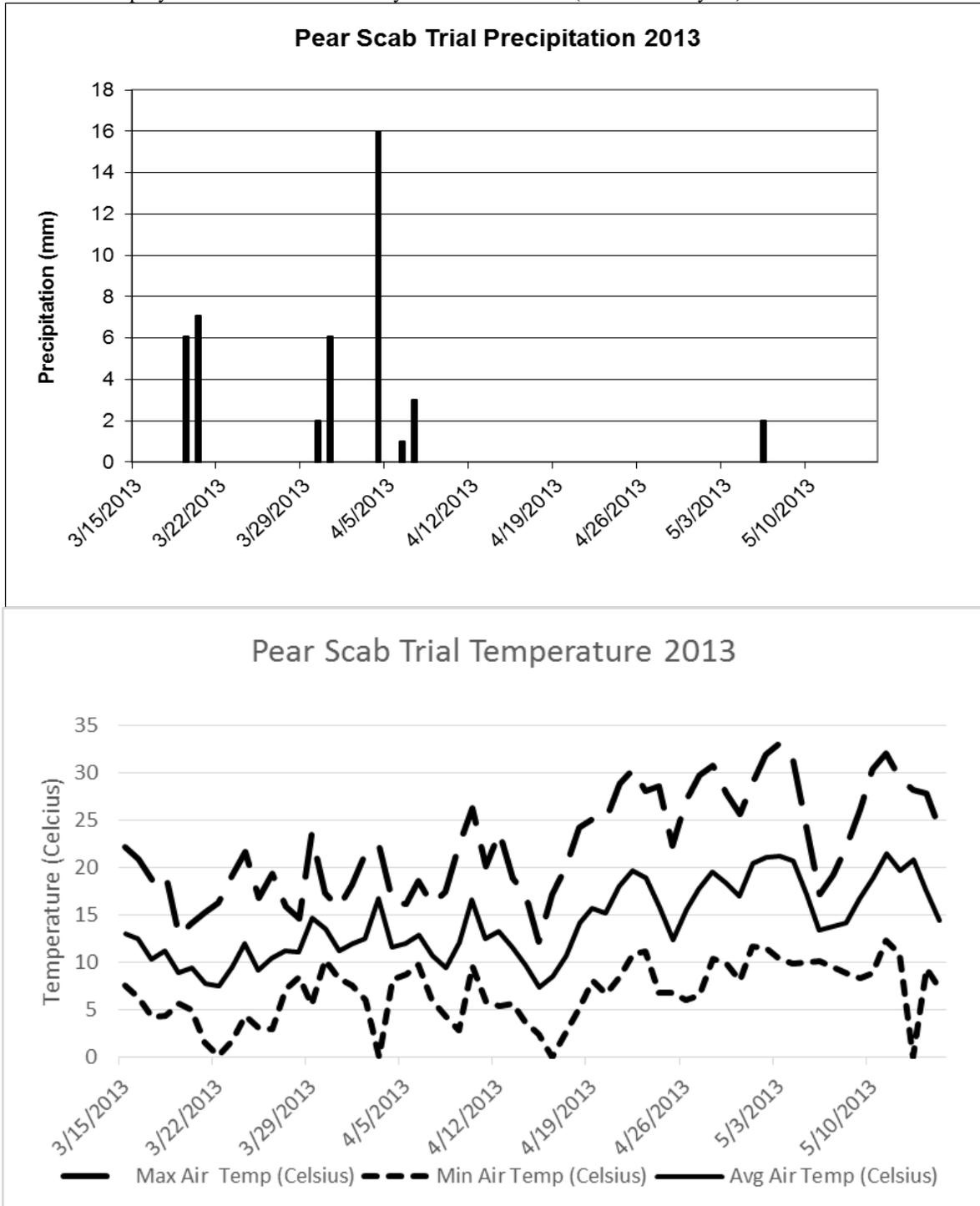
No.	Flag	Product(s)	FP/Acre	FP/Treatment
1	W	Unsprayed control	none	none
2	OC	Ziram	6 lb (4 apps)	50 g
3	B/BS	Syllit	0.75 qt (3 apps)	13 ml
5	OS	Merivon	5 oz (4 apps)	2.7 ml
6	GKD	Microthiol (sulfur)	30 lb	250 g
7	O	Serenade Optimum	24 oz	12.5 g
8	Y	GWN-10073	32 fl z	17.4 ml
9	RKD	Sovran	4 oz	2.1 g
10	PKS	Tebuzol 45 DF (same as Elite)	2 oz/100 gal	1.0 g
11	RKS	Fontelis	20 fl oz	10.9 ml
12	LG	Topsin-M	16 oz	8.4 g
13	KS	X4605	12 fl oz	3.8 ml

C. Disease and Statistical Analysis

Disease was assessed on May 23, 2013. Forty leaves and 40 fruits were randomly selected from each tree. The number of lesions was scored for each leaf and fruit; estimated counts were made when the boundaries of individual lesions could not be easily distinguished. Disease incidence per replicate tree was determined as the proportion of leaves and fruits that were infected by at least one lesion. Disease severity for each plot was obtained as the mean number of lesions on leaves and fruits. Data was analyzed using a one-way ANOVA and means were compared using Fisher's protected LSD test ($\alpha = 0.05$).

D. Weather and Disease

Weather for the spray season was somewhat dry with 8 rain events (Mar 15 – May 15) of 1-16 mm of rain.



Results

X4065 treatments appeared to control incidence and severity best (Tables 1 and 2). Fontelis, Merivon, Syllit, Topsin-M, Tebuzol 45 DF, Microthiol and Serenade Optimum all reduced pear scab incidence on fruit (Table 1). Neither Ziram nor GWN-10073 reduced disease significantly severity on fruit (Table 2). All treatments reduced incidence and severity of pear scab on leaves (Tables 3 and 4).

Table 1. Pear scab fruit incidence (means). Product names are followed by rate (per acre). Treatment means followed by the same letter are not significantly different according to Fisher's protected LSD test at $\alpha=0.05$.

Treatment	Rate/Acre	Fruit Incidence (%)
Unsprayed Control	none	0.15 a
Sovran, 4 oz	4 oz	0.10 ab
Ziram, 6 lbs	6 lbs	0.10 ab
GWN-10073, 32 oz	32 oz	.09 abc
Serenade Optimum, 24 oz	24 oz	.06 bcd
Microthiol (sulfur), 30 lb	30 lb	.06 bcd
Tebuzol 45 DF (Elite), 2 oz	2 oz	.05 bcd
Topsin-M, 16 oz	16 oz	.05 bcd
Syllit, .75 qt	.75 qt	.05 bcd
Merivon, 5 oz	5 oz	.04 bcd
Fontelis, 20 oz	20 oz	.03 cd
X4605, 12 oz	12 oz	.01 d

Table 2. Pear scab fruit severity (means). Product names are followed by rate (per acre). Treatment means followed by the same letter are not significantly different according to Fisher's protected LSD test at $\alpha=0.05$.

Treatment	Rate/Acre	Fruit Severity (Lesions/fruit)
Unsprayed Control	none	0.20 a
Ziram, 6 lbs	6 lbs	0.11 ab
GWN-10073, 32 oz	32 oz	0.10 bc
Sovran, 4 oz	4 oz	0.10 bc
Microthiol (sulfur), 30 lb	30 lb	0.07 bc
Tebuzol 45 DF (Elite), 2 oz	2 oz	0.07 bc
Serenade Optimum, 24 oz	24 oz	0.06 bc
Topsin-M, 16 oz	16 oz	0.06 bc
Syllit, .75 qt	.75 qt	0.06 bc
Merivon, 5 oz	5 oz	0.05 bc
Fontelis, 20 oz	20 oz	0.03 bc
X4605, 12 oz	12 oz	0.01 c

Table 3. Pear scab leaf incidence (means). Product names are followed by rate (per acre). Treatment means followed by the same letter are not significantly different according to Fisher's protected LSD test at $\alpha=0.05$.

Treatment	Rate/Acre	Leaf Incidence (%)
Unsprayed Control	none	0.27 a
Serenade Optimum, 24 oz	24 oz	0.15 b
Sovran, 4 oz	4 oz	0.11 bc
Topsin-M, 16 oz	16 oz	0.10 bcd
Microthiol (sulfur), 30 lb	30 lb	0.09 bcd
GWN-10073, 32 oz	32 oz	0.08 bcd
Ziram, 6 lbs	6 lbs	0.06 bcd
Fontelis, 20 oz	20 oz	0.05 bcd
Tebuzol 45 DF (Elite), 2 oz	2 oz	0.05 bcd
Merivon, 5 oz	5 oz	0.04 bcd
Syllit, .75 qt	.75 qt	0.03 cd
X4605, 12 oz	12 oz	0.00 d

Table 4. Pear scab leaf severity (means). Product names are followed by rate (per acre). Treatment means followed by the same letter are not significantly different according to Fisher's protected LSD test at $\alpha=0.05$.

Treatment	Rate/Acre	Leaf Severity (lesions/leaf)
Unsprayed Control	none	0.40 a
Serenade Optimum, 24 oz	24 oz	0.18 b
Sovran, 4 oz	4 oz	0.15 bc
Topsin-M, 16 oz	16 oz	0.13 bc
Microthiol (sulfur), 30 lb	30 lb	0.12 bc
GWN-10073, 32 oz	32 oz	0.09 bc
Ziram, 6 lbs	6 lbs	0.08 bc
Fontelis, 20 oz	20 oz	0.07 bc
Merivon, 5 oz	5 oz	0.06 bc
Tebuzol 45 DF (Elite), 2 oz	2 oz	0.06 bc
Syllit, .75 qt	.75 qt	0.04 bc
X4605, 12 oz	12 oz	0.00 c

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Appendix: Products tested

Product	Active ingredient(s) and concentration	Class	Manufacturer
Fontelis	Penthiopyrad (20%)	SDHI (7)	Dupont
GWN-10073	Proprietary	N/A	Proprietary
Merivon	Fluxapyroxad (21%), Pyraclostrobin (21%)	SDHI (7)/QoI (11)	BASF
Microthiol (sulfur)	Sulfur (80%)	Inorganic (M2)	United Phosphorous
Serenade Optimum	Bacillus subtilis (26%)	Microbial	Bayer
Sovran	Kresoxim-methyl (50%)	QoI (11)	Cheminova
Syllit	Dodine (40%)	Guanidine (M7)	Agriphar
Tebuzol 45 DF (Elite)	Tebuconazole (45%)	DMI-triazole (3)	United Phosphorous
Topsin-M	Thiophanate-methyl (70%)	MBC (1)	UPI
X4605	Proprietary	N/A	Proprietary
Ziram 76DF	Ziram (76%) Zinc (16.25%)	Carbamate (DMDC)3 (M3)	UPI

Appendix 1 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) Bay, et al. 2011. Grape powdery mildew trials, available at <http://plantpathology.ucdavis.edu/ext>, (3) various sources including product labels and/or MSDS, product websites, and personal communications.