

APPLE (*Malus domestica* 'Rome')  
Scab; *Venturia inaequalis*  
Powdery Mildew; *Podosphaera leucotricha*

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### **Evaluation of fungicides for control of apple scab and powdery mildew on Rome apples, 2009**

Fungicide treatments were arranged in a randomized complete block design in a block of 'Rome' apples on M-7 rootstock planted in 1979 on 20 x 20 ft spacing. Each treatment consisted of 4 single tree replicates. Fungicide treatments were applied using a hydraulic handgun sprayer at approximately 110 psi such that 5 to 7 gal of a spray suspension were applied per 4 trees (135 to 191 gal/A) depending on the time of year. Treatments were applied on either a 14 or 21 day interval depending on the protocol. Treatments for the 14 day interval were applied on 21 Apr (tight cluster), 30 Apr (pink), 10 May (full bloom), 26 May (1<sup>st</sup> cover), 9 Jun (2<sup>nd</sup> cover) and 23 Jun (3<sup>rd</sup> cover) for a total of 6 applications. Treatments for the 21 day interval were applied on 21 Apr (tight cluster), 30 Apr (pink), 21 May (late petal fall), 9 Jun (1<sup>st</sup> cover) and 30 Jun (2<sup>nd</sup> cover) for a total of 5 applications. Due to a week of unseasonable warm temperatures in late April and an impending rain storm the first fungicide application interval was shortened to ensure good coverage at a critical susceptible growth stage. No fertilizer was spread within tree rows. Trees were pruned on 20 Jan to 3 Feb. Insecticide sprays were applied to the entire block using a Rear's air blast speed sprayer. A dormant oil spray of Omni supreme-oil (5 gal/A) was applied on 18 Feb for aphid control. Success Naturalyte Insect Control (8 fl oz/A) was applied on 2 Jul for codling moth management. Weeds, in the tree row, were treated with Rely (5 qt/A) on 1 May and with Goal 2XL (2 qt/A) on 18 June. The entire block of trees was irrigated using low angle sprinkler heads for 8 hours on 25 July and again in late Aug. Apple scab infection periods were monitored using an Adcon A730 weather station equipped with standard sensors. Using a modified primary infection model (wet periods start with rain and end with 8 hr drying time), a total of 9 infection periods were detected from early Apr through Jun: 3 high infection periods (1 May, 1 and 3 Jun); 1 moderate infection period (13 May) and 5 low infection periods (9 and 12 Apr, and 4, 5 and 7 May). The incidence of leaf scab and powdery mildew was determined on 13 Jul, by examining all leaves from 20 arbitrarily selected vegetative shoots (228 to 331 leaves) from each tree. Incidence of scab on fruit and fruit russet was determined on 24 Jul by examining 100 fruit arbitrarily selected from each tree. Due to high disease pressure there were not enough fruits to sample from nontreated trees or trees treated with Yucca Ag-Aide.

Spring weather conditions were cold and dry during early shoot growth but back to typical conditions favorable for plant disease in May. Shoots covered with powdery mildew due to infection the previous year were easily observed on 4 May. Scab was first observed on nontreated trees on 11 May. All treatments significantly reduced development of scab on leaves when compared to nontreated trees except on trees treated with Yucca Ag-Aide. Lowest scab on leaves was recorded on trees treated with Luna Sensation, however, scab on trees treated with TopGuard plus Captan was not significantly different. Fruit heavily infected with scab typically falls off prior to disease ratings as happened on nontreated trees and trees treated with Yucca Ag-Aide. Lowest scab on fruit was recorded on trees treated with Luna Sensation, however, fruit scab on trees treated with DPX-LEM 17 at the 20 oz rate every 2 weeks was not significantly different. All treatments significantly reduced development of powdery mildew on leaves when compared to nontreated trees except on trees treated with Yucca Ag-Aide. Lowest powdery mildew was recorded on trees treated with TopGuard, however, powdery mildew on trees treated with Luna Sensation were not significantly different. Although not evaluated, overwintered powdery mildew shoots seemed to have less sporulation on trees treated with Luna Sensation. Leaves on these shoots were still deformed but not as white as on other trees. Similar observations were made many years ago when Rally was first introduced into the market. Fruit russet was lowest on trees treated every 3 weeks with DPX-LEM 17, however, all other treatments were not significantly different except for trees treated with low rates of DPX-LEM 17 every 2 weeks or Flint alternated with Procure every 3 weeks. We suspect the DPX-LEM 17 timed at late petal fall was responsible for the improved russet reduction. No phytotoxicity was observed in trees treated with any of the various materials used.

Treatment & Rate/A	Time of Application *	Apple Scab**		Powdery Mildew Leaves (%)**	Fruit Russet (%)**				
		Leaves (%)	Fruit (%)						
Nontreated .....		67.8	a	---	70.0	a	---		
Flint 50 WDG at 2.5 oz alt with Procure 480 SC at 12 fl oz....	A, C, F B, E, G.....	22.3	ef	30.8	cdef	33.8	bc	4.0	abcd
Flint 50 WDG at 2.5 oz alt with Procure 480 SC at 12 fl oz....	A, D, H B, F.....	23.0	def	37.5	bc	29.8	bc	5.0	abc
DPX-LEM 17 (20 SC) at 12 fl oz	A,B,C,E,F,G	28.0	de	35.3	cd	31.8	bc	5.8	ab
DPX-LEM 17 (20 SC) 16 fl oz	A,B,C,E,F,G	24.0	def	22.5	def	27.5	cd	6.5	a
DPX-LEM 17 (20 SC) at 16 fl oz	A,B,D,F,H	42.5	bc	51.3	ab	38.3	b	1.3	d
DPX-LEM 17 (20 SC) at 20 fl oz	A,B,C,E,F,G	24.3	def	18.0	fg	18.0	d	3.3	abcd
DPX-LEM 17 (20 SC) at 20 fl oz	A,B,D,F,H	32.5	cd	37.5	bc	39.0	b	1.3	d
Luna Sensation									
(USF 2016) 500 SC at 4 fl oz..	A,B,C,E,F,G	10.8	g	5.5	g	6.3	e	2.8	bcd
Top Guard 125 SC at 13 fl oz....	A,B,C,E,F,G	44.3	b	61.8	a	1.3	e	2.5	bcd
Top Guard 125 SC at 13 fl oz plus Dithane RS 75 DF at 48 oz.....	A,B,C,E,F,G	30.8	de	34.5	cde	1.5	e	1.8	cd
Top Guard 125 SC at 13 fl oz plus Captan 80 WDG at 40 oz.....	A,B,C,E,F,G	14.8	fg	20.0	efg	6.5	e	3.0	bcd
Yucca Ag-Aide at 128 fl oz.....	A,B,C,E,F,G	64.5	a	---		67.0	a	---	

\* Treatments were applied on A = 21 Apr (tight cluster), B = 30 Apr (pink), C= 10 May (full bloom), D = 21 May (late petal fall), E = 26 May, F = 9 Jun, G= 23 Jun and H= 30 Jun.

\*\*Means followed by the same letter do not differ significantly based on Fisher's protected LSD (P=0.05).

--- There were not enough fruits to sample from nontreated trees or trees treated with Yucca Ag-Aide.