

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

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Evaluation of fungicides for management of apple scab and powdery mildew on Rome apples, 2013

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 3 to 5 gal of a spray suspension were applied per 4 trees (82 to 136 gal/A) depending on the time of year. Treatments were applied on 12 Apr (tight cluster), 25 Apr (pink), 2 May (full bloom), 9 May, 17 May, 23 May (1st cover), 3 Jun (2nd cover), and 12 Jun. No fertilizer was spread within tree rows. A dormant oil spray of Omni supreme-oil (2 gal/100 gal water) was applied on 13 Feb for aphid and mite control. Asana XL (5 fl oz/A) was applied on 30 May for aphid and codling moth management. Insecticide sprays were applied to the entire block using a Rear's air blast speed sprayer. MCPA (40 oz/A) was applied on 20 Feb, then GoalTender (1 qt/A) plus Diuron (2 qt/A) was applied on 8 Mar for weed control. 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 8 infection periods were detected from early Apr through Jun: 2 moderate infection periods (21 and 23 May) and 6 low infection periods (5, 14 and 19 Apr, 16, 22 and 27 May). The incidence of leaf scab and powdery mildew was determined on 16 Jul, by examining all leaves from 20 arbitrarily selected vegetative shoots (201 to 342 leaves for an average of 298) from each tree. Incidence of scab on fruit and fruit russet was determined on 7 Aug by examining 100 fruit arbitrarily selected from each tree. Due to unexpected poor growth of some trees only 3 replicates were used for data analysis.

Spring growing conditions during bloom were unusually dry with 3 weeks of warm 80 F weather starting at the end of April. Shoots covered with powdery mildew due to infection the previous year were observed on 22 Apr. Powdery mildew infection of new leaves was observed on 29 Apr. Scab was first observed on non-treated crabapple trees in a nearby block on 8 Apr and within this block of 'Romes' on 6 May. All fungicide treatments had significantly less scab on leaves and fruit when compared to non-treated trees. Lowest scab on leaves was recorded on trees treated with Luna Sensation alternated with Sonata on 14 or 7 day intervals, respectively. However, scab on leaves from trees treated with the same combination on only 14 day intervals or with Luna Sensation alternated with TopGuard plus Koverall were not significantly different. Scab could not be found on fruit from trees treated with Luna Sensation alone, however, fruit scab on trees treated with any other fungicide treatment was not significantly different. All fungicide treatments had significantly less powdery mildew on leaves when compared to non-treated trees. Lowest powdery mildew on leaves was recorded on trees treated with Luna Sensation alternated with Sonata on 14 or 7 day intervals, respectively. However, powdery mildew on leaves from most all other treatments were not significantly different except on trees treated with Luna alternated with Sonata on only 14 day intervals. There was no significant difference among fungicide treatments with regard to fruit russet. In general, improved disease control was obtained when repeating fungicide applications 7 days after a Sonata application rather than waiting 14 days as with Luna Sensation. Field notes indicate a certain age class of leaf was infected with powdery mildew on trees treated with Serenade. This evidence points to the weaker activity of Serenade relative to Sonata or Luna Sensation. 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 (%)		
Non-treated	None	34.3 a	42.0 a	51.3 a	8.7
Luna Sensation 500 SC at 5 fl oz.....	A, B, D, F, G	4.5 d	0.0 b	7.5 c	3.3
Luna Sensation 500 SC at 5 fl oz alternate	A, D, G				
Serenade Optimum WP at 16 oz	B, F.....	16.6 b	4.3 b	12.5 bc	4.3
Luna Sensation 500 SC at 5 fl oz Alternate every 14 days with	A, D, G				
Sonata ASO at 3 qt	B, F.....	9.2 cd	4.0 b	15.9 b	5.0
Luna Sensation 500 SC at 5 fl oz Alternate on 7 or 14 day intervals with	A, C, F, H				
Sonata ASO at 3 qt	B, E, G.....	4.6 d	0.7 b	5.9 c	5.3
Luna Sensation 500 SC at 5 fl oz alternate	A, D, G				
TopGuard SC at 13 fl oz plus Koverall 75 WG at 3 lb	B, F.....	8.2 cd	1.7 b	7.1 c	7.7
Pristine 38 WDG at 16.5 oz plus Koverall 75 WG at 3 lb alternate	A, D, G				
TopGuard SC at 13 fl oz plus Koverall 75 WG at 3 lb	B, F.....	11.5 bc	3.3 b	11.3 bc	3.0

* Treatments were applied on A = 12 Apr (tight cluster), B = 25 Apr (pink), C = 2 May (full bloom), D = 9 May, E = 17 May, F = 23 May (1st cover), G= 3 Jun (2nd cover), and H = 12 Jun.

**Means followed by the same letter do not differ significantly based on Fisher's protected LSD (P=0.05). Means without letters do not differ significantly.