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

J. W. Pscheidt, L. D. Wallace and G. Kenyon
Dept. of Botany and Plant Pathology
Oregon State University
Corvallis, OR 97331-2903

EFFICACY OF ORGANIC FUNGICIDES FOR CONTROL OF APPLE SCAB AND POWDERY MILDEW, 2000: 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 200 psi at a rate of 200 gal water/A. Approximately 7.5 gal of a spray suspension were applied per 4 trees. Treatments were applied on a 7 to 10 day schedule on 19 Apr (95% pink), 26 Apr, 6 May (60% full bloom), 16 May, 23 May (95% petal fall), 3 Jun (1st cover), 13 Jun (2nd cover), and 21 Jun (3rd cover). On 19 Apr, one of the four trees spayed with QRD 137 at 8 lb/A was accidentally sprayed with Microthiol. Insecticides were applied to the entire block using an air blast speed sprayer on 7 Mar (Weco Supreme Oil at 4 gal/A plus Diazinon 50 WP at 4 lb/A), 28 Jun (Guthion at 2 lb/A), and 9 Aug (Diazinon 50 WP at 4 lb/A) for rosey apple aphid and coddling moth management. Goal 2xL (3 qt/A) tank mixed with Gyphos (2 qt/A) and R-11 (0.5%) was applied to control weeds in the tree row floor on 12 Apr. Roundup Ultra at 3 qt/A was also used on 24 Aug. Apple scab infection periods were monitored using a Luft Agro-Meterological station (HP-100). Using a modified primary infection model (wet periods start with rain and end with 8 hr drying time), a total of 10 infection periods were detected from Apr through Jun: 4 high infection periods (14 Apr, 9 May, 6 and 11 Jun); 2 moderate infection periods (12 and 21 Apr); and 4 light infection periods (28 Apr, 1, 7 and 27 May). The incidence of leaf scab and powdery mildew was determined on 5 Jun by examining all leaves from 10 vegetative shoots (80-117 leaves) randomly selected from the lower portion of each tree. The incidence of a ring of russeted tissue at the calyx end of the fruit was assessed on 10 Jul by examining all the fruit on each tree. A final assessment of the fruit was performed on 3 Oct by picking and examining 100 fruit per tree for incidence of scab and russet (excluding the ring russet).

Trees treated with Lime Sulfur had the best leaf scab control of the organic fungicides and leaf scab control was not significantly different from trees treated with the non-organic fungicide Flint. Leaf scab on trees treated with Serenade or QRD 137 was not significantly different from nontreated trees. Due to high disease pressure, nontreated trees and trees treated with Serenade or QRD 137 did not produce enough fruit for fruit scab or russet evaluations. There was no significant difference when the percentage of fruit scab was compared among all remaining treatments. All fungicide treated trees had significantly less powdery mildew than nontreated trees except for trees treated with the high rate of Serenade. Powdery mildew was not observed on trees treated with Flint, however, the percentage of leaves found with powdery mildew on trees treated with Lime Sulfur, Microthiol or the high rate of QRD 137 were not significantly different. There was no significant difference when the percentage of fruit with russet was compared among treatments that yielded enough fruit for evaluation. Trees treated with Lime Sulfur had a significantly higher amount of ring russet at the calyx end of the fruit. This ring russet was observed on many different trees treated with a wide variety of organic, non-organic and biological fungicides. It may have been related to a late frost event on 24 Apr (low of 30°F). No phytotoxicity was observed on any trees treated with any fungicide, however, Serenade treated trees looked chlorotic and defoliated due to poor disease control. Many sulfur and Serenade based treatments resulted in high residue levels on leaves and fruits. Serenade solutions were excessively foamy under our conditions.

	Apple Scab		Powdery Mildew	Fruit Russet	
Treatment & Rate/A	Leaves (%)[1]	Fruit (%)[2]	Leaves (%)[1]	Entire surface (%)[2]	Ring at calyx end (%)[1]
Nontreated ……..	51.6 a	---[3]	7.0 a	---[3]	---[3]
Serenade (QRD 132) at 4 lb……	51.2 a	---	3.6 b	---	---
Serenade (QRD 132) at 8 lb……	47.0 a	---	5.1 ab	---	---
QRD 137 at 4 lb……..	42.6 a	---	3.3 b	---	---
QRD 137 at 8 lb……..….	46.2 a	---	2.4 bc	---	---
Lime Sulfur (29%) at 2 gal…….	1.3 c	9.7	0.3 c	7.6	19.0 a
Microthiol 80 WG at 10 lb…….	15.3 b	24.5	0.3 c	8.4	4.7 b
Flint 50 WG at 2 oz……	0.2 c	21.2	0.0 c	6.1	5.5 b

[1] Means followed by same letter do not differ significantly based on Fisher's protected LSD (P=0.05).
[2] Means do not differ significantly based on Fisher's protected LSD (P=0.05).
[3] --- = Little to no fruit developed on these trees.