

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

J. W. Pscheidt, and John P. Bassinette
Dept. of Botany and Plant Pathology
Oregon State University
Corvallis, OR 97331-2903

Fungicides for control of apple scab and powdery mildew, 2005.

Fungicide treatments were arranged in a randomized complete block design in a block of 'Braeburn' apples on ELMA-111 rootstock planted in 1995 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 150 psi such that 3 to 8 gal of a spray suspension were applied per 4 trees (82 to 217 gal/A) depending on the time of year. Treatments were applied on 18 Mar (pre-pink), 30 Mar (pink), 14 Apr (full bloom), 27 Apr (petal fall), 11 May (1st cover), 26 May (2nd cover), 8 Jun (3rd cover) and 22 Jun (4th cover). No fertilizer was spread within tree rows. Tree pruning occurred between 4 Jan and 13 Jan. Insecticides were applied to the entire block using a Rear's air blast speed sprayer. A dormant oil spray (2 gal/A) was applied on 22 Feb for aphid control and Assail 70 WDG (3 oz/A) was applied on 27 May for codling moth management. Weeds, in the tree row, were treated with Buccaneer (32 oz/A) plus Diuron 4L (2 lb/A) on 23 Mar, Rely (4qt/A) on 26 Apr and Roundup ULTRAMAX (32 oz/A) plus Rely (4qt/A) on 30 Jun. The entire block of trees was irrigated using low angle sprinkler heads for 8 hours in early 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 14 infection periods were detected from bud break in late Mar through Jun: 4 high infection periods (18 and 25 Mar, 23 Apr and 8 May); 3 moderate infection periods (23 Mar, 3 and 17 May) and 7 low infection periods (7, 8, 10, and 13 Apr, 1 and 18 May and 6 Jun). The incidence of leaf scab and powdery mildew was determined on 2 to 3 Aug and 15 Aug, respectively, by examining all leaves from 20 arbitrarily selected vegetative shoots (133 to 401 leaves) from each tree. Evaluation for leaf mildew on nontreated trees was difficult due to high scab severity. Incidence of scab on fruit and fruit russet was evaluated on 23 Aug by picking and examining up to 100 fruit/tree. Fruit set was poor due to heavy crop load the previous year and cool wet conditions during bloom. The number of fruit per tree varied greatly among trees in the trial but was not due to fungicide applications. Only trees with more than 33 fruit were used in the statistical analysis.

Spring weather conditions in Western Oregon were considered wet especially when a "pineapple express" weather system brought warm wet weather from 25 to 27 Mar. Frequent rainfall resulted in high apple scab pressure. First scab lesions were observed on 13 Apr. All fungicide treated trees had significantly less apple scab on leaves than nontreated trees except for trees treated with Rally plus Pencozeb. Fungal resistance to Rally is highly suspected. Lowest amount of leaf scab was found on trees treated with the highest rate of DPX-LEM, however, trees treated with Pristine, Cabrio or the middle rate of DPX-LEM were not significantly different. Lowest amount of scab on fruit was on trees treated with the high rate of Pristine but trees treated with the middle rate of Pristine, Cabrio or the high rate of DPX-LEM were not significantly different. Trees treated with Captan plus Rally had significantly less scab than trees treated with Pencozeb plus Rally. There was no significant difference in leaf scab among Pristine treated trees, however, the high and middle rate of Pristine had better fruit scab control than the low rate under these severe conditions. Trees treated with the lowest rate of DPX-LEM had significantly more scab than trees treated with the middle or higher rate of the chemical. There was no significant difference among various treatments with respect to powdery mildew or fruit russetting. No phytotoxicity was observed on any trees treated with fungicide.

Treatment & Rate/A	Time of Application*	Apple Scab**		Powdery Mildew	Fruit Russet
		Leaves (%)	Fruit (%)	Leaves (%)**	(%)**
Nontreated	none	100 a	***	1.1	***
Rally 40W at 5 oz +					
Pencozeb 75DF at 3lb	All.....	82.2 ab	86.8 a	3.3	3.0
Rally 40W at 5 oz +					
Captan 80WP at 2.5 lb	All.....	63.5 c	60.8 bc	0.9	0.5
Procure 480SC at 1 pt +					
Pencozeb 75DF at 3lb.....	All.....	65.7 bc	49.0 cd	1.4	0.5
Procure 480SC at 1 pt alternate					
Flint 50 at 2 oz/a	A,C,E,G B,D,F,H	54.0 cde	***	1.3	***
Scala 60 at 10 fl oz then					
Flint 50 at 2 oz then	A,B C,D				
Captan 80 at 2.5 lb.....	E,F,G,H	58.9 cd	37.7 de	2.1	3.1
Pristine 38 WG at 0.526 lb +					
Sylgard 309 at 4 fl oz/100gal.....	All.....	37.9 ef	23.8 ef	1.0	6.1
Pristine 38 WG at 0.658 lb +					
Sylgard 309 at 4 fl oz/100gal.....	All.....	41.5 def	17.8 fg	0.9	5.8
Pristine 38 WG at 0.92 lb +					
Sylgard 309 at 4 fl oz/100gal.....	All.....	32.9 f	6.0 g	0.9	6.5
Cabrio at 12 oz +					
Sylgard 309 at 4 fl oz/100gal.....	All.....	32.2 f	14.8 fg	1.2	5.0
DPX-LEM 17 at 9.6 fl oz.....					
All.....		71.0 bc	72.3 ab	1.5	0.1
DPX-LEM 17 at 16.8 fl oz.....					
All.....		38.6 ef	***	1.6	***
DPX-LEM 17 at 20.6 fl oz.....					
All.....		26.4 f	18.7 fg	1.6	0.8

* Treatments were applied on A = 18 Mar (pre-pink), B= 30 Mar (pink), C = 14 Apr (full bloom), D = 27 Apr (petal fall) E = 11 May (1st cover), F = 26 May (2nd cover), G = 8 Jun (3rd cover) and H = 22 Jun (4th cover)

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

*** Not enough fruit to make measurement.