

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

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Evaluation of a growth regulator for control of apple diseases, 2007 – 2008.

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 110 psi such that 4 to 6 gal of a spray suspension were applied per 4 trees (108 to 135 gal/A) depending on the time of year. Treatments were applied on 30 Mar 07 (pre-pink), 26 Apr 07 (late bloom/petal fall), and 25 May 07 (cover, 2 inch fruit). No fertilizer was spread within tree rows. Trees were pruned from 16 to 17 Jan 07. Insecticide sprays were applied to the entire block using a Rear's air blast speed sprayer. Omni dormant oil spray (4 gal/A) was applied on 4 Mar 07 for aphid control. Assail 70 WDG (5 oz/A) was applied on 25 May 07 and 10 Jul 07 and Success (8 oz/A) was applied on 8 Jun 07 for codling moth management. Weeds, in the tree row, were treated with Buccaneer (16 oz/A) plus Goaltender (8 oz/A) on 13 Mar 07 and with Buccaneer (16 oz/A) plus Rely (16 oz/A) on 8 May 07. The entire block of trees was irrigated using low angle sprinkler heads for 8 hours in late Aug 07. 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 10 infection periods were detected from bud break in late Mar through Jun 07: 3 high infection periods (8, 11 and 21 Apr); 2 moderate infection periods (16 Apr and 3 May) and 5 low infection periods (7 Apr, 1, 18 and 20 May and 9 Jun). A total of 6 infection periods were detected from early Apr through Jun 08. Terminal shoot length was determined on 3 Jul 07 by measuring the length of 20 arbitrarily selected vegetative shoots from each tree. The incidence of leaf scab and powdery mildew was determined on 2 Aug 07, by examining all leaves from 20 arbitrarily selected vegetative shoots (242 to 404 leaves) from each tree. Incidence of scab on fruit and fruit russet was not evaluated in 2007 due to poor fruit set throughout the block. No applications for the control of scab or powdery mildew were made during the 2008 growing season. However, terminal shoot length was again determined on 12 Aug 08 by measuring the length of 20 arbitrarily selected vegetative shoots from each tree. The incidence of leaf scab, fruit scab and powdery mildew was again determined on 5 Aug 08, by examining all leaves from 20 arbitrarily selected vegetative shoots (279 to 346 leaves) and 100 fruit from each tree.

Spring weather conditions during 2007 in Western Oregon were considered average with plenty of wet periods at moderate temperatures resulting in several infection periods for various diseases. First scab lesions were observed on 9 Apr 07 on crabapple pollenizers within this block. All fungicide treated trees had significantly less apple scab than nontreated trees except trees treated twice with CVG-349 (Table 1). All fungicide treated trees had significantly less powdery mildew than nontreated trees. The amount of disease on trees treated once with CVG-349 was not significantly different than the amount on trees treated twice with Banner Maxx plus OHP 6672. Trees treated with CVG-349 had significantly shorter (and fatter) shoots than on nontreated trees. This difference was observed by 4 Jun 07.

Spring weather conditions during 2008 in Western Oregon were considered cool resulting in slow crop development and a 2 week delay in major growth stages through the growing season. First scab lesions were observed on 28 Apr 08. Trees treated with CVG-349 in 2007 had significantly less apple scab on leaves in 2008, although the overall amount was still considered high (Table 2). There were no significant differences in apple scab found on the fruit, powdery mildew on leaves or average shoot length among the various treatments in 2008.

Table 1. Disease data and shoot length measurements for 2007.

Treatment & Rate/100 gal	Time of Application*	Apple Scab Leaves (%)**	Powdery Mildew Leaves (%)**	Ave. Shoot Length (in)**
Nontreated	None	52.3 a	11.5 a	21.3 a
CVG-349 at 80 oz plus				
Quest at 32 oz plus				
Nufilm at 16 oz	A.....	23.0 b	7.5 b	15.1 b
CVG-349 at 80 oz plus				
Quest at 32 oz plus				
Nufilm at 16 oz	A, C.....	54.5 a	4.5 cd	8.6 c
Banner Maxx at 4 oz plus				
OHP 6672 4.5 L at 20 oz	A, B.....	17.3 bc	5.8 bc	20.8 a
Banner Maxx at 4 oz plus				
OHP 6672 4.5 L at 20 oz	A, B, C.....	11.3 d	2.9 d	18.2 ab

* Treatments were applied on A = 30 Mar 07 (pre-pink), B= 26 Apr 07 (full bloom) and/or C = 25 May 07 (cover, 2 inch fruit).

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

Table 2. Disease data and shoot length measurements for 2008.

Treatment & Rate/100 gal	Time of Application*	Apple Scab**		Powdery Mildew Leaves (%)**	Ave. Shoot Length (in)**
		Leaves (%)	Fruit (%)		
Nontreated	None	53.3 a	88.3	9.3	23.0
CVG-349 at 80 oz plus					
Quest at 32 oz plus					
Nufilm at 16 oz	A.....	44.8 b	81.8	7.0	26.8
CVG-349 at 80 oz plus					
Quest at 32 oz plus					
Nufilm at 16 oz	A, C.....	45.3 b	89.0	8.3	23.5
Banner Maxx at 4 oz plus					
OHP 6672 4.5 L at 20 oz	A, B.....	50.3 ab	90.3	10.3	25.3
Banner Maxx at 4 oz plus					
OHP 6672 4.5 L at 20 oz .	A, B, C.....	56.5 a	90.8	8.8	23.0

* Treatments were applied only in 2007, there were no applications of fungicides during the 2008 growing season.

** 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.