

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

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Evaluation of a growth regulator for control of diseases on Jonathon apple, 2008

Fungicide treatments were arranged in a completely randomized design in a block of 'Jonathon' apples planted in 1954 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 6 gal of a spray suspension were applied per 4 trees (135 to 162 gal/A) depending on the time of year. Treatments were applied on 24 Apr (pink bud), 8 May (full bloom), and 4 Jun (cover, 1/2 inch fruit). 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 6 infection periods were detected from early Apr through Jun: 2 high infection periods (7 and 19 Apr); 1 moderate infection period (29 Apr) and 3 low infection periods (5 and 23 Apr, and 2 Jun). Fertilizer (40-0-0-5.6S) at 20 lb/A was spread within tree rows on 16 Apr. Trees were lightly pruned to remove dead branches and open the canopy on 18 Mar. No insecticides were applied to the block. Weeds, in the tree row, were treated with Goaltender (2 qt/A) plus Round-up Ultramax (2 qt/A) on 25 Mar. The entire block of trees was irrigated using low angle sprinkler heads for 8 hours in late Jul. The incidence of leaf scab and powdery mildew was determined on 4 Aug, by examining all leaves from 20 arbitrarily selected vegetative terminal shoots (154 to 320 leaves) from each tree. Incidence of scab on fruit and fruit russet was determined on 11 Aug by examining 100 fruit arbitrarily selected from each tree. Terminal shoot length was determined on 19 Aug by measuring the length of 20 arbitrarily selected vegetative shoots from each tree.

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 5 May while overwintered powdery mildew flag shoots were observed on 28 Apr. There were no significant differences among the various treatments with respect to apple scab. The single application called for in protocols was made after several scab infection periods which might explain the poor scab control in this block. Only trees treated with Banner Maxx plus OHP 6672 three times had significantly less powdery mildew on the leaves than nontreated trees. All fungicide treated trees had significantly less fruit russet than nontreated trees. Trees treated with CVG-349 had significantly more fruit russet than trees treated with other fungicides. Trees treated once with CVG-350 had levels of disease that were not significantly different than trees treated once with Banner Maxx plus OHP 6672. There were no significant differences among the various treatments with respect to average shoot length.

Table 1. Effect of growth regulator on disease development.

Treatment & Rate/100 gal	Time of Application*	Apple Scab**		Powdery Mildew	Fruit Russet
		Leaves (%)	Fruit (%)	Leaves (%)**	(%)**
Nontreated	None	15.5	3.0	6.3 a	37.8 a
CVG-349 at 87 oz plus					
Quest at 32 oz plus					
Nufilm at 16 oz	A.....	14.3	2.3	5.5 a	15.8 b
CVG-350 at 43.5 oz plus					
Quest at 32 oz plus					
Nufilm at 16 oz	A	21.3	1.8	4.8 a	3.8 c
CVG-350 at 58 oz plus					
Quest at 32 oz plus					
Nufilm at 16 oz	A.....	22.3	2.0	6.0 a	7.5 c
Banner Maxx at 4 fl oz plus					
OHP 6672 at 20 fl oz	A.....	28.8	2.5	5.0 a	8.3 c
Banner Maxx at 4 fl oz plus					
OHP 6672 at 20 fl oz	A, B, C.....	24.3	1.3	1.0 b	8.3 c

* Treatments were applied on A = 24 Apr (pink), B= 8 May (full bloom) and/or C = 4 Jun (cover, 1/2 inch fruit).

** 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.

Table 2. Effect of growth regulator on shoot length.

Treatment & Rate/100 gal	Time of Application*	Ave. Shoot Length (in)**
Nontreated	None	15.5
CVG-349 at 87 oz plus		
Quest at 32 oz plus		
Nufilm at 16 oz	A.....	17.9
CVG-350 at 43.5 oz plus		
Quest at 32 oz plus		
Nufilm at 16 oz	A	14.2
CVG-350 at 58 oz plus		
Quest at 32 oz plus		
Nufilm at 16 oz	A.....	14.7
Banner Maxx at 4 fl oz plus		
OHP 6672 at 20 fl oz	A.....	16.5
Banner Maxx at 4 fl oz plus		
OHP 6672 at 20 fl oz	A, B, C.....	15.0

* Treatments were applied on A = 24 Apr (pink), B= 8 May (full bloom) and/or C = 4 Jun (cover, 1/2 inch fruit).

** Means without letters do not differ significantly.