

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

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Evaluation of fungicides for management of apple diseases on Braeburn, 2020

Fungicide treatments were arranged in a randomized complete block design in an orchard 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 3 to 4 gal of a spray suspension was applied per 4 trees (82 to 109 gal/A). Treatments were applied on 26 Mar (green tip), 10 Apr (pink), 17 Apr (full bloom), 1 May (petal fall), 15 May (fruit set, traditional 1st cover), and 28 May (2nd cover). No fertilizer was spread within tree rows. Trees were pruned from 6 to 8 Jan. A dormant oil spray of Omni supreme-oil (1.5 gal/A) was applied on 10 Feb and Movento (4 fl oz/A) was applied on 5 May for aphid and San Jose scale management. Insecticide sprays were applied to the entire block using a Rear's air blast speed sprayer. Makaze (5 pt/A) plus Goal 2XL (32 fl oz/A) was applied on 5 Feb for management of weeds. Apple scab infection periods were monitored using a Meter Atmos 41 weather station (located in a nearby hops field) equipped with standard sensors including one for leaf wetness. 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 Apr through Jun: 2 high infection periods (13 May and 9 Jun), 5 moderate infection periods (3 Apr, 1, 13, and 16 May and 13 Jun) and 7 low infection periods (1, 18 and 22 Apr, 17 and 30 May, 6 and 14 Jun). The incidence of leaf scab and powdery mildew was determined on 18 Jun, by examining all leaves from 20 arbitrarily selected vegetative shoots (154 to 277 leaves with an average of 246) from each tree. Incidence of scab on fruit and fruit russet was determined on 24 Jul by examining 100 fruit arbitrarily selected from each tree.

After half the normal rainfall during the dormant season, spring weather conditions were considered normal to wet. Scab was first observed on crabapple pollenizers on 30 Mar and then on non-treated trees on 20 Apr. Shoots covered with powdery mildew due to infection the previous year were also observed on 20 Apr. All trees treated with fungicide had significantly less apple scab on leaves and significantly less powdery mildew than non-treated trees. There was not enough fruit on non-treated trees for rating due to these diseases. Lowest level of apple scab on leaves was found in trees treated with the high rate of Excalia during bloom, however, leaf scab on trees from all other fungicide treatments were not significantly different. Lowest level of apple scab on fruit was found on trees treated with low rate of Excalia during bloom, however, fruit scab on trees from all other fungicide treatments were not significantly different. Lowest level of powdery mildew on leaves was found in trees treated with Fontelis during bloom, however, powdery mildew on trees from all other fungicide treatments were not significantly different. Highest level of fruit russet was found on trees treated with the low rate of Excalia during bloom and it was significantly higher than all other fungicide treatments. Lowest level of fruit russet was found in trees treated with the high rate of Excalia during bloom, however, fruit russet on trees treated with Fontelis during bloom or starting with Excalia were not significantly different. No phytotoxicity was observed in trees treated with any of the materials used.

| Treatment & rate/A or /100 gal as indicated below | Time of application* | Apple scab** | | Powdery mildew Leaves (%)** | Fruit russet (%)** |
|--|-------------------------|--------------|-----------|--------------------------------------|-----------------------|
| | | Leaves (%) | Fruit (%) | | |
| Non-treated | None | 84.6 a | --- | 37.4 a | --- |
| Koverall 75 WG at 6 lb then | A | | | | |
| Excalia at 3 fl oz plus | | | | | |
| Syl-Coat at 8 fl oz/100 gal alternated | B and D | | | | |
| Inspire Super at 12 fl oz then | C | | | | |
| Captan 80 WDG at 5 lb..... | E and F..... | 36.0 b | 10.5 | 4.3 b | 10.0 a |
| Koverall 75 WG at 6 lb then | A | | | | |
| Excalia at 4 fl oz plus | | | | | |
| Syl-Coat at 8 fl oz/100 gal alternated | B and D | | | | |
| Inspire Super at 12 fl oz then | C | | | | |
| Captan 80 WDG at 5 lb..... | E and F..... | 32.7 b | 16.5 | 4.2 b | 3.3 b |
| Excalia at 4 fl oz plus | | | | | |
| Syl-Coat at 8 fl oz/100 gal then | A and B | | | | |
| Koverall 75 WG at 6 lb then | C | | | | |
| Inspire Super at 12 fl oz then | D | | | | |
| Captan 80 WDG at 5 lb..... | E and F..... | 42.1 b | 29.3 | 5.9 b | 4.5 b |
| Koverall 75 WG at 6 lb then | A | | | | |
| Fontelis at 20 fl oz plus | | | | | |
| Syl-Coat at 8 fl oz/100 gal alternated | B and D | | | | |
| Inspire Super at 12 fl oz then | C | | | | |
| Captan 80 WDG at 5 lb..... | E and F..... | 41.0 b | 22.5 | 3.2 b | 4.5 b |

* Treatments were applied on A = 26 Mar (green tip), B = 10 Apr (pink), C = 17 Apr (full bloom), D = 1 May (petal fall), E = 15 May (fruit set, traditional 1st cover), and F = 28 May (2nd cover).

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