

HAZELNUT (*Corylus avellana* 'Ennis')
Eastern Filbert Blight; *Anisogramma anomala*

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Greenhouse evaluation of fungicides for protection and after infection activity against eastern filbert blight, 2003 - 2004.

Eight week old hazelnut seedlings grown from open-pollinated seed of 'Ennis' were sprayed with various fungicides using a hand held pump sprayer 24 hours before, and 24, 48, 72 and 96 hours after inoculation. In the first set of experiments, Orbit (2.5 fl oz/100 gal water), Procure (4 oz/100 gal water), Cabrio (0.3 lb/100 gal water) and Flint (1 oz/100 gal water) were compared with nontreated plants for after infection activity. Seedlings were inoculated with ascospores of *Anisogramma anomala* (5.0×10^6 spores per ml) using a pump sprayer. Each treatment consisted of 12 seedling trees. Two sets of these seedlings were inoculated on 24 Jun 03 and another two sets were inoculated on 14 Jul 03 for a total of 4 sets or replicates. In a second set of experiments, Orbit was tested at 0, 0.5, 1.0, 2.0, 4.0 and 8.0 fl oz/100 gal water for after infection activity. The second experiment also had nontreated control plants as well as water treated (0.0 oz Orbit) control plants. These seedlings were also inoculated with ascospores of *Anisogramma anomala* (5.0×10^6 spores per ml) using a pump sprayer. Each treatment consisted of 4 sets of 12 seedling trees. Seedlings were inoculated on 5 or 12 May 03. For each experiment, all seedlings were placed in a mist chamber with intermittent misting for 10 sec out of every 30 min during daylight hours after inoculation. All seedlings were removed from the mist chamber after 3 days incubation and placed on greenhouse benches (70°F days and 62°F nights). Seedlings were transplanted from small "6-paks" to 1 gal pots on 4 Jun 03. Plants from experiment #2 were fertilized with Osmocote Slo-Release fertilizer 18-6-12 (1 teaspoon/pot) on 28 Jul 03. All seedlings were moved to an outside (colder), rain protected location during Oct 03. Disease incidence was determined by recording trees that had died or showed symptoms of EFB or cambium staining below the point of inoculation on 30 Apr 04 (experiment 1) or 3 May 04 (experiment 2).

Experiment #1

Most trees inoculated with EFB but not sprayed with fungicide became infected for an overall average of 90% (Figure 1 or 2). ANOVA indicated significant regressions for trees treated with Orbit, Cabrio and Flint but not for the nontreated trees or those treated with Procure. All groups of trees treated with fungicide 24 hours before inoculation had a significantly lower disease incidence than nontreated trees. Trees treated with Orbit or Procure 24 hours before inoculation had uncharacteristically high disease incidence while trees treated with these same chemicals 24 hours after inoculation developed lower disease incidence (Fig 1). It is not known why this occurred. Trees treated with Orbit or Procure had lower disease incidence than nontreated trees even when treated 96 hours after inoculation. Trees treated with Cabrio or Flint also had lower disease incidence than nontreated trees until 96 hours after inoculation when disease incidence was not significantly different (Fig 2). In general, these data indicate that after infection activity of these chemicals declines as the time between infection and chemical application increases. Most useful activity appears to be prior to 72 hours after an infection period.

Experiment #2

Most trees inoculated with EFB but not sprayed with fungicide or water became infected for an overall average of 92% (data not shown). All groups of trees treated with any rate of Orbit 24 hours before inoculation had a significantly lower disease incidence than nontreated trees (Figures 3 and 4). Although all groups of trees treated with any rate of Orbit 24 hours after inoculation had lower disease incidence than nontreated trees, trees treated at the 0.5 fl oz rate were close to nontreated trees. Only trees treated with the 4 or 8 fl oz rate of Orbit had a lower disease incidence than nontreated trees 96 hours after inoculation. These data indicate that the after infection activity of Orbit is dependent on the rate.