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

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**Whole orchard evaluation of fungicides for control of eastern filbert blight, 2010.**

The goal of this trial is to evaluate yield protection and fungicides for EFB control on mature, commercial sized hazelnut trees (rather than 2 to 3 year old transplants). A 1 acre block of Ennis hazelnuts with Butler pollenizers (every 3rd tree in every 3rd row) planted in 1986 was selected at the Botany and Plant Pathology Field Laboratory. Trees had been planted on a 10 x 20 foot spacing but every other tree was removed in Dec 99 for a final spacing of 20 x 20 feet. This block was selected since it had been sprayed 2 to 3 times each year with chlorothalonil since 2000 for EFB before any known infections had occurred. EFB cankers discovered during the 2004 growing season in a nearby block planted at the same time with identical stock indicate that these trees have been exposed to ascospores each year since 2001 or 2002. In the spring of 2004, a fungicide trial was established in this block. Treatments were arranged in a randomized complete block design. Each treatment consisted of 4 blocks (replicates) containing a group of 9 trees, (8 Ennis and 1 Butler). Each set of 9 trees was composed of 3 consecutive trees in a row and in 3 consecutive rows. Fungicide treatments consisted of nontreated trees, trees treated with 4 applications of Bravo Weather Stik at 64 fl oz/A, and trees treated with the Best Management Practice. For 2010, the best management practice consisted of an application of Bravo Weather Stik (64 fl oz/A) at bud break, then Bravo Weather Stik at 32 fl oz/A plus Gem 500 SC at 3.8 fl oz/A, 2 weeks after bud break, then Bravo Weather Stik at 32 fl oz/A plus Orbit 3.6 EC at 8 fl oz/A, 4 weeks after bud break, then Bravo Weather Stik at 32 fl oz/A plus Cabrio EG at 8 oz/A, 6 weeks after bud break. Past fungicide treatments can be found in Table 2. Fungicides were applied using a hydraulic handgun sprayer at 110 psi and at a rate of 200 gal water/A such that approximately 18 gal of a spray suspension were applied per set of 9 trees. Fungicide treatments were applied on 10 Mar (bud break), 23 Mar, 6 and 19 Apr. Suckers were controlled with Rely (1 pt/A) applied on 14 May. Weeds were sprayed with Maddog (3.6 pt/A) plus Rely (3.6 pt/A) on 17 Jun. Envidor 2SC (22 oz/A) was applied on 17 Apr for control of big bud mite. Asana XL (16 oz/A) was applied on 8 Jul for filbert worm control. Trees were pruned, from 29 to 30 Dec 09, by selectively removing the tallest branches and water sprouts from the center of each tree. Urea fertilizer (46-0-0) was applied on 20 Apr at a rate of 250 lb/A. Supplemental irrigation was applied 20 Jul. Trees were scouted for EFB cankers during the dormant and summer growing seasons. Plots were harvested on 18 Oct 10 by raking nuts into windrows, then placed in wooden tote boxes using a Flory Hazelnut Harvester. The harvester was designed to allow soil and dirt to fall between conveyor belt chains and to blow or suck away leaves, husks and some blank nuts. Nuts were then conveyed into large wooden bins and weighed using a Vishay Celtron model Digital Summit 3000 scale.

Cankers of eastern filbert blight were first observed in this block on 16 Aug 10. Cankers were found in a single nontreated tree as well as a single tree treated with the best management practice. Cankers were thought to be 2 years old indicating infection was likely in 2008. This block will be heavily scouted during the dormant season of 2010 to 2011. Growth regulation activity of Orbit was first observed in late Apr 08. Data were normalized for moisture content to make year to year comparisons. Average yield per tree was 46% lower for 2010 but not significantly different among the various treatments (Table 1). Field run weight was 42, 35 and 39 lb/tree for the nontreated, Bravo Weather Stik and BMP treatments, respectively.

Table 1. Fungicide treatments and clean dry weight yield for 2009 and 2010.

| Treatment | Ave Yield/Tree 2009* (lbs) | Ave Yield/Tree 2010* (lbs) | Ave. change from 09 to 10* (%) |
|---|---|---|---|
| Non-treated ……...……...…… | 38.2 | 28.3 | -34.8 |
| Bravo Weather Stik (4 applications)..... | 36.3 | 23.5 | -56.4 |
| Best Management Practice…… | 37.6 | 25.9 | -46.2 |

*Means without letters are not significantly different.

Table 2. Best Management Practice used each year.

| Year | Best Management Practice | Year | Best Management Practice |
|---|---|---|---|
| 2004 | Bravo Weather Stik at 32 fl oz/100 gal then<br>Flint 50 WG at 1 oz/100 gal then<br>Orbit 3.6 EC at 4 fl oz/100 gal<br><br>(1 application each) | 2008 | Bravo Weather Stik at 32 fl oz/100 gal then<br>Gem 500 SC at 3 fl oz/A then<br>Orbit 3.6 EC at 8 fl oz/A then<br>Cabrio EG at 8 oz/A plus<br>Silwet L-77 at 6.4 oz/100 gal<br><br>(1 application each) |
| 2005 | Bravo Weather Stik at 32 fl oz/100 gal then<br>Flint 50 WG at 2 oz/100 gal then<br>Orbit 3.6 EC at 4 fl oz/100 gal then<br>Cabrio EG at 4.3 oz/100 gal<br><br>(1 application each) | 2009 | Bravo Weather Stik at 64 fl oz/A then<br>Gem 500 SC at 8 fl oz/A plus<br>Bravo Weather Stik at 32 fl oz/A then<br>Orbit 3.6 EC at 8 fl oz/A plus<br>Bravo Weather Stik at 32 fl oz/A then<br>Cabrio EG at 8 oz/A plus<br>Bravo Weather Stik at 32 fl oz/A |
| 2006 | Bravo Weather Stik at 32 fl oz/100 gal then<br>Flint 50 WG at 4 oz/A then<br>Orbit 3.6 EC at 8 fl oz/A then<br>Cabrio EG at 9.5/A plus<br>Break-Thru at 4 oz/100 gal<br><br>(1 application each) | 2010 | Bravo Weather Stik at 64 fl oz/A then<br>Gem 500 SC at 3.8 fl oz/A plus<br>Bravo Weather Stik at 32 fl oz/A then<br>Orbit 3.6 EC at 8 fl oz/A plus<br>Bravo Weather Stik at 32 fl oz/A then<br>Cabrio EG at 8 oz/A plus<br>Bravo Weather Stik at 32 fl oz/A |
| 2007 | Bravo Weather Stik at 32 fl oz/100 gal then<br>Gem 500 SC at 8 fl oz/A plus<br>Silwet L-77 at 6.4 oz/100 gal then<br>Orbit 3.6 EC at 8 fl oz/A then<br>Cabrio EG at 8 oz/A plus<br>Silwet L-77 at 6.4 oz/100 gal<br><br>(1 application each) | | |