

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, 2012.

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 chlorothalonil at 64 fl oz/A, and trees treated with the Best Management Practice. For 2012, the best management practice consisted of an application of Echo 720 (64 fl oz/A) at bud break, then Quadris Top at 14 fl oz/A, 2 weeks after bud break, then Stratego at 15 fl oz/A, 4 weeks after bud break, then Echo 720 (64 fl 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 16 Mar (bud break), 2 and 17 Apr, and 2 May. Suckers were cut by hand on 27 Jul. Weeds were sprayed with Makaze (32 oz/A) plus Rely (64 oz/A) on 30 May. There was no application for control of big bud mite. Asana XL (16 fl oz/A) was applied on 19 Jul for filbert worm control. Trees were pruned in the dormant period by selectively removing the tallest branches and water sprouts from the center of each tree. There was no supplemental irrigation applied this year. The orchard was fertilized with 46-0-0 at 200 lb/A on 12 Apr. The orchard floor was “floated” on 10 Sep to remove dead weeds and blanks, respectively. Trees were scouted for EFB cankers during the dormant and summer growing seasons. Plots were harvested on 11 Oct 12 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. More intensive scouting indicated that cankers were thought to be 2-3 years old indicating infection was likely in 2007. During the 2011 to 2012 scouting season the number of cankers in nontreated plots increased from 19 to over 700 while remaining relatively small (18 to 41 cankers) in treated plots (Figures 1 and 2). Yield data were normalized for moisture content to make year to year comparisons. Average yield per tree decreased for nontreated trees and increased for fungicide treated trees but not significantly different among the various treatments (Table 1). Field run weight was 37, 39 and 40 lb/tree for the nontreated, Echo 720 and BMP treatments, respectively. To date there has been no difference in yield among the various treatments.

Table 1. Fungicide treatments and clean dry weight yield for 2011 and 2012.

Treatment	Ave Yield/Tree 2011* (lbs)	Ave Yield/Tree 2012* (lbs)	Ave. change from 11 to 12* (%)
Non-treated	27.5	26.5	-5.3
Echo 720 (4 applications).....	26.1	27.7	6.5
Best Management Practice.....	26.2	28.6	9.2

*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 Flint 50 WG at 1 oz/100 gal then Orbit 3.6 EC at 4 fl oz/100 gal (1 application each)	2009	Bravo Weather Stik at 64 fl oz/A then Gem 500 SC at 8 fl oz/A plus Bravo Weather Stik at 32 fl oz/A then Orbit 3.6 EC at 8 fl oz/A plus Bravo Weather Stik at 32 fl oz/A then Cabrio EG at 8 oz/A plus Bravo Weather Stik at 32 fl oz/A
2005	Bravo Weather Stik at 32 fl oz/100 gal then Flint 50 WG at 2 oz/100 gal then Orbit 3.6 EC at 4 fl oz/100 gal then Cabrio EG at 4.3 oz/100 gal (1 application each)	2010	Bravo Weather Stik at 64 fl oz/A then Gem 500 SC at 3.8 fl oz/A plus Bravo Weather Stik at 32 fl oz/A then Orbit 3.6 EC at 8 fl oz/A plus Bravo Weather Stik at 32 fl oz/A then Cabrio EG at 8 oz/A plus Bravo Weather Stik at 32 fl oz/A
2006	Bravo Weather Stik at 32 fl oz/100 gal then Flint 50 WG at 4 oz/A then Orbit 3.6 EC at 8 fl oz/A then Cabrio EG at 9.5/A plus Break-Thru at 4 oz/100 gal (1 application each)	2011	Bravo Weather Stik at 64 fl oz/A then Gem 500 SC at 2 fl oz/A plus Bravo Weather Stik at 32 fl oz/A then Tilt EC at 8 fl oz/A plus Bravo Weather Stik at 32 fl oz/A then Cabrio EG at 5 oz/A plus Bravo Weather Stik at 32 fl oz/A
2007	Bravo Weather Stik at 32 fl oz/100 gal then Gem 500 SC at 8 fl oz/A plus Silwet L-77 at 6.4 oz/100 gal then Orbit 3.6 EC at 8 fl oz/A then Cabrio EG at 8 oz/A plus Silwet L-77 at 6.4 oz/100 gal (1 application each)	2012	Echo 720 at 64 fl oz/A then Quadris Top at 14 fl oz then Stratego at 15 fl oz then Echo 720 at 64 fl oz/A
2008	Bravo Weather Stik at 32 fl oz/100 gal then Gem 500 SC at 3 fl oz/A then Orbit 3.6 EC at 8 fl oz/A then Cabrio EG at 8 oz/A plus Silwet L-77 at 6.4 oz/100 gal (1 application each)		

Figure 1. Cumulative number of cankers found in all 4 treatment plots each year.

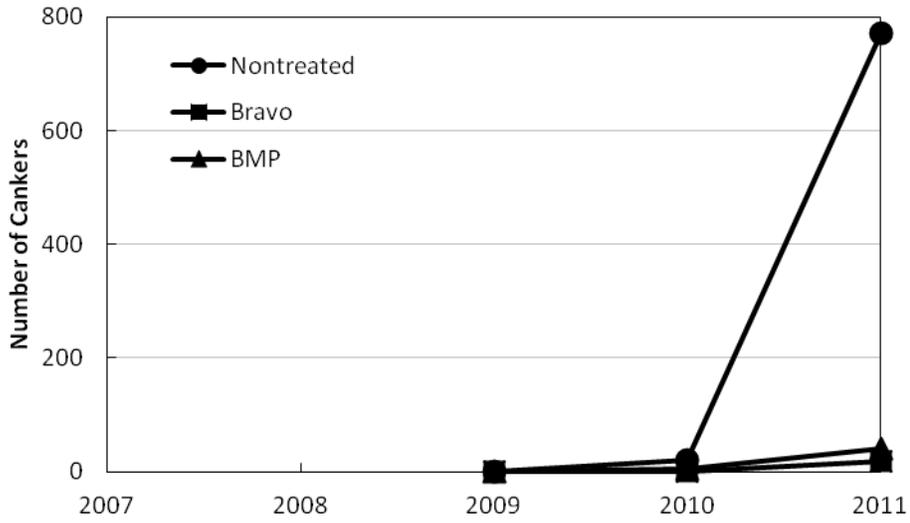


Figure 2. Cumulative number of cankers found in all 4 treatment plots each year normalized for the year they likely appeared in the plots. Some cankers were 2 or 3 years old when discovered and thus first appear in prior years.

