

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

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Evaluation of fungicide programs for control of eastern filbert blight, 2005 - 2006.

Healthy appearing two-year-old 'Ennis' hazelnut trees were planted on 31 Jan 05 and 7 Feb 05 at the North Willamette Research and Extension Center, Aurora, OR. Limbs with EFB cankers were cut from a heavily diseased 'Ennis' orchard near Keiser, OR on 22 to 23 Nov 04. A total of 500 cankered limbs were placed on top of chicken wire, supported by a 6 wire horizontal trellis, above test trees on 22 Feb 05. Additional limbs were placed on the wire 8 and 30 Mar 05 and 26 Apr 05. Treatments were arranged in a randomized complete block design. Each treatment consisted of 6 single tree replicates. Fungicide suspensions were applied on two sides of the tree to runoff using a Solo-Pump-Style backpack sprayer. Approximately 0.6 gal of a spray suspension was used per 6 trees. Fungicide treatments were applied on 2 Mar 05 (bud break), 16 and 30 Mar 05, and 19 Apr 05 for a total of 4 applications. Roundup ULTRAMAX (2 % solution) was applied to control weeds between trees on 6 Jul 05 and 7 Sep 05. Trees were fertilized with Urea (46-0-0) at a rate of 2 lb/6 trees on 3 May 05. Supplemental irrigation was provided as needed during the 2005 growing season. Shoot length was determined on 20 Oct 05 by measuring only the growth that occurred during the 2005 growing season (from bud scar to terminal bud). The number of EFB cankers on the main tree trunk and total length of these cankers/tree was determined on 26 Jul 06.

Highest spore counts occurred in the two weeks following the second application and then again 3 to 4 weeks after the last application. Based on this pattern, we suspect that fungicides positioned 2nd or 4th in the application schedule had greater influence over final disease control. Trees treated with Bravo for all applications or the Bravo/Flint/Orbit/Cabrio combination had the lowest number of cankers per tree. The numbers of cankers on trees treated with several other programs were not significantly different from those on trees treated with only Bravo 4 times including Bravo for the first 3 applications only, Bravo followed by Flint, Flint followed by Orbit, Bravo alternated with Flint, and Bravo alternated with Orbit. Cankers on trees treated with the following programs were not significantly different from those found on nontreated trees: Orbit alone, Bravo/Flint/Cabrio/Orbit/, Bravo followed by Orbit, Orbit followed by Bravo, Flint Followed by Bravo, and Flint alternated with Orbit. Having Bravo and/or Cabrio positioned second or fourth in this program seemed to have the better disease control. There was no statistical difference between any treatments with respect to final shoot length.

Treatment and Rate/100 gal water	Application Timing**	Ave Number of Cankers/Tree*	Total Canker Length/Tree* (cm)	Shoot Length (cm)
Nontreated	None	4.0 a	165.1 a	34.5
Bravo Weather Stik at 32 fl oz.....	BB, 2 and 4 wks only....	1.2 def	19.8 c	32.0
Bravo Weather Stik at 32 fl oz.....	All 4 apps...	0.5 ef	6.4 c	23.9
Orbit 2.5 fl oz	All 4 apps...	2.2 abcde	31.0 bc	28.4
Bravo Weather Stik at 32 fl oz then Flint 50 WG at 1 oz then Orbit at 2.5 fl oz then Cabrio 20 EG at 4.75 oz.....	Bud Break 2 wks later 4 wks later 6 wks later..	0.5 f	10.2 c	231
Bravo Weather Stik at 32 fl oz then Flint 50 WG at 1 oz then Cabrio 20 EG at 4.75 oz then Orbit at 2.5 fl oz	Bud Break 2 wks later 4 wks later 6 wks later..	2.2 abcd	32.5 bc	28.2
Bravo Weather Stik at 32 fl oz then Orbit 2.5 fl oz	BB & 2 wks 4 & 6 wks...	2.8 abc	57.2 ab	22.4
Orbit 2.5 fl oz then Bravo Weather Stik at 32 fl oz.....	BB & 2 wks 4 & 6 wks...	3.8 ab	103.4 ab	21.3
Bravo Weather Stik at 32 fl oz then Flint 50 WG at 1 oz	BB & 2 wks 4 & 6 wks...	1.0 def	15.0 c	30.5
Flint 50 WG at 1 oz then Bravo Weather Stik at 32 fl oz	BB & 2 wks 4 & 6 wks...	3.8 ab	57.7 ab	22.9
Flint 50 WG at 1 oz then Orbit 2.5 fl oz	BB & 2 wks 4 & 6 wks...	1.8 def	35.1 c	28.4
Bravo Weather Stik at 32 fl oz then Flint 50 WG at 1 oz then Bravo Weather Stik at 32 fl oz then Flint 50 WG at 1 oz	Bud Break 2 wks later 4 wks later 6 wks later..	2.3 bcdef	36.3 bc	25.9
Bravo Weather Stik at 32 fl oz then Orbit at 2.5 fl oz then Bravo Weather Stik at 32 fl oz then Orbit at 2.5 fl oz	Bud Break 2 wks later 4 wks later 6 wks later..	1.5 cdef	27.4 bc	20.8
Flint 50 WG at 1 oz then Orbit at 2.5 fl oz then Flint 50 WG at 1 oz then Orbit at 2.5 fl oz	Bud Break 2 wks later 4 wks later 6 wks later..	3.0 abc	50.3 ab	27.2

- * Analysis of variance is based on $\log_{10}(x+1)$ transformation. Means followed by the same letter do not differ significantly based on Fisher's protected LSD ($P=0.05$). Means without any letters did not differ significantly.
- ** Fungicide treatments were applied on BB = Bud Break (2 Mar 05), 2 wks = 2 weeks after bud break (16 Mar 05), 4 wks = 4 weeks after bud break (30 Mar 05), and 6 wks = 6 weeks after bud break (19 Apr 05).