

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

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Evaluation of fungicides for control of eastern filbert blight, 2004 - 2005.

Healthy appearing two-year-old 'Ennis' hazelnut trees were planted on 15 to 16 Jan 04 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 20 to 21 Jan 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 12 Feb 04. Additional limbs were placed on the wire 8, 15, and 29 Mar 04 and 14 Apr 04. Treatments were arranged in a randomized complete block design. Each treatment consisted of 8 single tree replicates. Fungicide suspensions were applied on two sides of the tree to runoff with a backpack sprayer equipped with a hand wand. Approximately 0.8 gal of a spray suspension was used per 8 trees. Fungicide treatments were applied on 12 Mar 04 (bud break), 29 Mar 04, 12 Apr 04, and 26 Apr 04 for a total of 4 applications. Roundup ULTRAMAX at 2 gal/100 gal water was used between trees to control weeds on 14 Apr 04. Both Roundup ULTRAMAX (2 gal/100 gal water) and Class Crop Protection 40A (1 qt/100 gal water) were applied between trees to control weeds 29 Apr 04. Trees were fertilized with Triple 16 (16-16-16-6) at a rate of 2 lb/6 trees on 21 Apr 04. Trees were painted with a 50% solution of white latex paint on the southwest side of the trunk on 10 May 04 to prevent summer and winter sunburn. Supplemental irrigation was provided as needed during the 2004 growing season. The number of EFB cankers on the main tree trunk and total length of these cankers/tree was determined on 7 to 8 Jul 05.

A PVC trough spore trap was placed in the site on 16 Feb 04. The spore trap consisted of a 2.3 meter long 1/2 inch PVC pipe split in half lengthwise, supported by 2 metal posts, and angled at 20 degrees to drain into a covered 16 liter collection bucket. Each bucket contained 200 ml of 50% copper sulfate v/v as a spore preservative and germination inhibitor. Rainwater from the traps was collected on 12 and 29 Mar 04, 13 and 26 Apr 04, 12 May 04 by swirling the contents and pouring into a volumetric cylinder to measure the total volume of rainwater collected. Approximately 500 ml of the rainwater was collected for laboratory analysis and the copper sulfate solution was replenished after each collection. The rainwater was filtered first through a 20 μ m sieve then through a cellulose nitrate filter with 0.8 μ m pore size. This filter paper was placed on a microscope slide, stained with 0.05% (v/v) trypan blue in lactoglycerine. The number of ascospores on filters was then determined using a light microscope at 400X and used to calculate the number of ascospores collected per M^2 of trap surface. Rainfall during the spore trapping periods were as follows: 2.68 in from 16 Feb 04 to 12 Mar 04, 0.82 in from 12 Mar 04 to 29 Mar 04, 0.06 in from 29 Mar 04 to 12 Apr 04, 1.37 in from 12 Apr 04 to 26 Apr 04 and 0.94 in from 26 Apr 04 to 12 May 04.

Spore counts were considered very low based on past spore counts during similar periods of time (Fig 1). Low rainfall may have contributed to these low counts. In past years with such low counts we have had little disease develop even on nontreated trees. This year so much disease developed that even our best treatments seemed unable to keep canker development below 0.5 cankers per tree as has traditionally been observed in the past. There were also an unusually high number of cankers on sucker stems. This may have been due to the new practice of placing cankered limbs above trees during early spring growth. This may have artificially pushed spore production past the end of fungicide applications, beyond our data collection information. The number of cankers on trees treated with Stimplex, Elevate, Orbit, Elite, the high and low rate of Procure, both rates of V-10116, Flint, Cabrio, or Endura were not significantly different than the number of cankers found on nontreated trees. Trees treated with Bravo, Switch, the middle rate of Procure, Stratego, USF 2010, and Pristine had significantly fewer cankers than nontreated trees. There was no significant difference in the number of cankers found among trees treated with different rates of the same fungicide such as for Procure or V-10116. Only limited conclusions can be drawn from this data set due to the high disease pressure. The pre-mix combinations seemed to do well this year and included Stratego (propiconazole (Orbit-like) and trifloxystrobin (Flint)), Switch (cyprodinil (Vanguard) and fludioxonil), and Pristine (pyraclostrobin (Cabrio) and boscalid (Endura)). Past and current data indicate that cyprodinil or boscalid were ineffective for EFB control alone. Future trials should investigate the effectiveness of fludioxonil alone.

Treatment and Rate/100 gal water	Ave Number of Cankers/Tree*	Total Canker Length/Tree* (cm)
Nontreated	3.6 ab	74.7 ab
Bravo Weather Stik at 32 fl oz.....	2.0 cd	41.4 f
Elevate 50 WDG at 0.75 lb.....	2.5 abcd	54.6 abc
Switch at 10 oz.....	1.1 d	20.6 def
Orbit at 2.5 fl oz	3.1 bcd	71.4 bcdef
Elite 45 DF at 2 oz.....	2.9 abcd	51.6 bcdef
Procure 50 WS at 2 oz.....	2.8 abcd	61.2 abcde
Procure 50 WS at 3 oz.....	2.3 cd	47.8 cdef
Procure 50 WS at 4 oz.....	2.0 bcd	47.8 abcdef
V-10116 at 0.027 lb ai.....	2.6 abcd	47.0 abcd
V-10116 at 0.034 lb ai.....	2.8 abcd	45.7 abcd
Stratego 250 EC at 5 fl oz.....	1.8 cd	27.9 ef
Flint 50 WG at 1 oz	2.4 bcd	43.2 bcdef
USF 2010 at 2 fl oz.....	1.5 cd	28.2 cdef
Cabrio (BAS 500) at 0.3 lb.....	2.5 bcd	46.0 cdef
Endura (BAS 510) at 0.175 lb ai.....	3.3 abc	62.5 abcd
Pristine 38 WG (BAS 516) 0.46 lb plus Superior Spray Oil at 1 gal.....	1.9 cd	32.5 bcdef
Stimplex at 1 gal.....	5.0 a	111.5 a

* Analysis of variance is based on log₁₀ (x+1) transformation. Means followed by the same letter do not differ significantly based on Fisher's protected LSD (P=0.05).