

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

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Need for surfactants with fungicides for control of eastern filbert blight, 2011 - 2012.

Healthy appearing two-year-old 'Ennis' hazelnut trees were planted on 19 Jan 11 at the Botany and Plant Pathology Field Laboratory, Corvallis, OR. Limbs with EFB cankers were cut on 2 Nov 10 from heavily diseased 'Ennis' trees located at the NWREC. A total of 400 cankered limbs were placed above test trees on chicken wire, supported by a 6 wire horizontal trellis, on 3 Mar 11. Treatments were arranged in a randomized complete block design. Each treatment consisted of 7 single tree replicates. Fungicides were applied to trees from two directions until runoff using a Solo-Pump-Style backpack sprayer. Approximately 0.25 gal of a spray suspension was used per 7 trees within each treatment. Fungicide treatments were applied on 23 Mar 11 (bud break), 5 Apr 11, 19 Apr 11, and 3 May 11 for a total of 4 applications. Fungicides included Cabrio, Gem, Tilt, Procure and Quash. The traditional, nonionic surfactant Regulaid was used as was the organosilicone surfactants Silwett or Syl-Tac. Sucker shoots were killed on treatment trees using Rely (25 oz/10 gal water) on 24 May 11. Buccaneer (1 qt/A) was applied on 24 Aug for weed control. Trees were fertilized with 46-0-0 at a rate of 0.5 lb/6 trees on 6 Apr 11, again on 26 Jul 11 and with 16-16-16+6S at a rate of 0.5 lb/6 trees on 3 Jun 11. Supplemental irrigation was provided as needed during the 2011 growing season. Plant growth regulation effects on shoots and phytotoxicity were evaluated on 2 Jun 11 where 0 = no effect, 1 = slight effect that is not obvious, 2 = obvious darker green leaves and shortened internodes, 3 = Deep green leaves and shortened shoots but no necrosis, 4 = intense symptoms with marginal burning, leaf necrosis and/or possible dead shoots. The number of EFB cankers on the main tree trunk and total length of these cankers/tree was determined on 8 Aug 12. Data was analyzed both as a randomized complete block design and as a factorial trial with 2 factors (fungicide and surfactant).

Spring weather conditions in Western Oregon were considered cool and wet resulting in slow crop development and a 2 to 3 week delay in crop growth stages through the growing season. There was a significant ANOVA (including all treatments) indicating the number of cankers on nontreated trees was significantly higher than the number found on fungicide treated trees. Factorial analysis found no significant interaction between factors but also that the addition of a surfactant did not significantly reduce the number of cankers that developed on trees (3.5 cankers for trees treated with fungicide alone vs. 3.6 cankers for trees treated with fungicide plus surfactant). Plant growth regulation (PGR) effects were obvious on Tilt treated trees as expected but also on trees treated with Quash plus Regulaid. Although the addition of surfactants significantly increased the PRG effect on Quash treated trees, in general, addition of a surfactant did not significantly increase phytotoxicity associated with these fungicides.

Treatment and Rate/100 gal water	Ave Number of Cankers/Tree*	Total Canker Length/Tree* (cm)	Growth Regulation Effect and/or phytotoxicity**	
			2 Jun	
Nontreated	8.3 a	291 a	0.1	b
Cabrio 20 EG at 4.75 oz	3.4 b	80 b	0.4	b
Cabrio 20 EG at 4.75 oz plus Silwet L-77 at 6.4 fl oz.....	4.0 b	88 b	0.9	b
Gem 500 SC at 1.5 fl oz	3.4 b	103 b	1.0	b
Gem 500 SC at 1.5 fl oz plus Silwet L-77 at 6.4 fl oz.....	4.0 b	108 b	0.6	b
Tilt 3.6 EC at 4 fl oz	3.0 b	89 b	2.4	a
Tilt 3.6 EC at 4 fl oz plus Regulaid at 1 pt	2.7 b	90 b	2.8	a
Procure 480 SC at 4 fl oz.....	3.9 b	123 b	0.6	b
Procure 480 SC at 4 fl oz plus Syl-Tac at 8 fl oz	3.6 b	74 b	0.9	b
Quash 50 WDG at 4 oz	3.6 b	86 b	2.9	a
Quash 50 WDG at 4 oz plus Regulaid at 1 pt	3.7 b	80 b	3.4	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). Means without letters do not differ significantly.

** Plant growth regulation effects of shoots where 0 = no effect, 1 = slight effect that is not obvious, 2 = obvious darker green leaves and shortened internodes, 3 = Deep green leaves and shortened shoots but no necrosis, 4 = intense symptoms with marginal burning, leaf necrosis and/or possible dead shoots.