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

J.W. Pscheidt, S. Heckert, and S.A. Cluskey
Dept. of Botany and Plant Pathology
Oregon State University
Corvallis, OR 97331-2903

Need for surfactants with fungicides for control of eastern filbert blight, 2010 - 2011.

Healthy appearing two-year-old 'Ennis' hazelnut trees were planted on 21 Jan 10 to 3 Feb 10 at the Botany and Plant Pathology Field Laboratory, Corvallis, OR. Limbs with EFB cankers were cut from a heavily diseased 'Ennis' orchard near Keizer, OR from 30 Nov 09 to 4 Dec 09. A total of 400 cankered limbs were placed above test trees on chicken wire, supported by a 6 wire horizontal trellis, on 23 Feb 10 and 2 Mar 10. Treatments were arranged in a randomized complete block design. Each treatment consisted of 8 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 8 trees within each treatment. Fungicide treatments were applied on 10 Mar 10 (bud break), 24 Mar 10, 6 Apr 10, and 19 Apr 10 for a total of 4 applications. Fungicides included Cabrio, Gem, Orbit, Procure and Quash. The traditional, nonionic surfactant Regulaid was used as was the organosilicone surfactant Silwett. Sucker shoots were sprayed using Rely (60 oz/A) on 14 May 10 and 9 Jul 10. Rely (60 oz/A) and Roundup (120 oz/A) plus surfactant was applied to control weeds between trees on 23 Apr 10 and 31 Aug 10. Rely (60 oz/A) and Maddog plus surfactant was applied to control weeds between trees on 6 May 10 and 26 Jul 10. Preen (6 lb/1,000 sq ft, with fertilizer 9-17-9) was used on 30 Apr 10. Trees were fertilized with 29-5-5 at a rate of 1 lb/8 trees on 19 Jul 10. Supplemental irrigation was provided as needed during the 2010 growing season. Plant growth regulation effects on shoots and phytotoxicity were evaluated on 23 Apr 10 and 24 May 10 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 22 to 23 Aug 11. Data was analyzed both as a randomized complete block design and as a factorial trial with 2 factors (fungicide and surfactant).

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 and that the addition of a surfactant significantly reduced the number of cankers that developed on trees (2.4 cankers for trees treated with fungicide alone vs. 1.8 cankers for trees treated with fungicide plus surfactant). Plant growth regulation (PGR) effects were obvious on Orbit 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. Similar results were obtained last year under low inoculum conditions.

Treatment and Rate/100 gal water	Ave Number of Cankers/Tree*	Total Canker Length/Tree* (cm)	Growth Regulation Effect and/or phytotoxicity**	
			23 April	24 May
Nontreated ……...……	5.0 a	254.6 a	0.0 c	0.1 b
Cabrio 20 EG at 4.75 oz ……..….	1.9 bc	40.9 bc	0.1 c	0.0 b
Cabrio 20 EG at 4.75 oz plus Silwet L-77 at 6.4 fl oz……..	0.9 c	24.6 c	0.4 c	0.0 b
Gem 500 SC at 1.5 fl oz ……...	2.4 b	68.5 b	0.4 c	0.0 b
Gem 500 SC at 1.5 fl oz plus Silwet L-77 at 6.4 fl oz……..	0.9 c	23.6 c	0.0 c	0.0 b
Orbit 3.6 EC at 4 fl oz …….....	2.5 b	61.6 b	2.3 a	0.3 ab
Orbit 3.6 EC at 4 fl oz plus Regulaid at 1 pt ……	1.9 c	50.5 bc	2.4 a	0.5 a
Procure 480 SC at 6 fl oz……..….	2.5 b	62.3 b	0.0 c	0.0 b
Procure 480 SC at 6 fl oz plus Regulaid at 1 pt …….	2.8 b	81.0 b	0.0 c	0.1 b
Quash 50 WDG at 4 oz ……	2.5 b	70.6 b	1.1 b	0.1 b
Quash 50 WDG at 4 oz plus Regulaid at 1 pt ……..……	2.4 b	66.9 b	2.5 a	0.6 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 did 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.