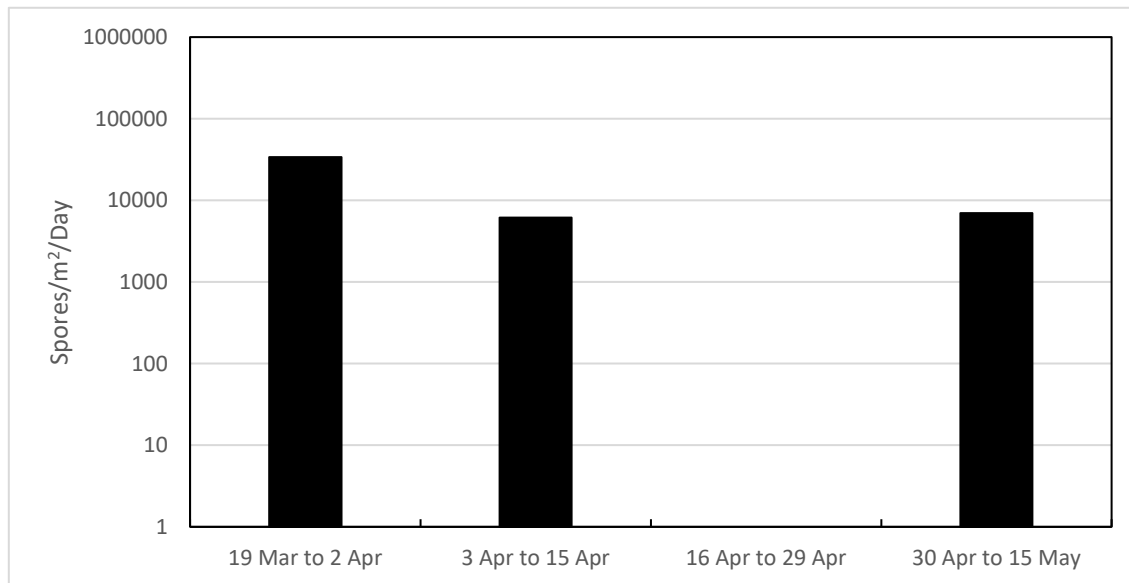


Evaluation of fungicides for management of eastern filbert blight, 2019 - 2020.

Healthy appearing two-year-old ‘Ennis’ hazelnut trees were planted from 29 to 31 Jan 2019 at the Botany and Plant Pathology Field Laboratory, Corvallis, OR. Trees were planted in 3 rows in an area 10 x 141 ft and 3 ft apart from each other. Limbs with EFB cankers were cut from heavily diseased trees during Jan and Feb 2019. A total of 275 cankered limbs were placed above test trees on chicken wire frames supported by a wooden trellis, on 7 Mar 2019. 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 Stihl SG20-Pump-Style backpack sprayer equipped with a brass hollow cone nozzle. Approximately 0.26 gal of a spray suspension was used per 8 trees within each treatment. Fungicide treatments were applied on 26 Mar 2019 (bud break), 9 Apr 2019, 23 Apr 2019, and 7 May 2019 for a total of 4 applications. Makaze (3%) was applied alone as a general and/or spot treatment on 22 Apr and 10 May, then tank mixed with Forfeit 280 (1.7 oz/gal) on 12 Jun, 3 Jul, and 26 Jul 2019 for management of weeds. Trees were fertilized with 46-0-0 at a rate of 0.5 lb/6 trees on 8 Apr 2019, 3 Jun 2019, 8 Jul 2019 and 26 Mar 2020. Sucker were managed by hand cutting on 29 Jun 2020. Supplemental irrigation was provided as needed during the 2019 growing season. The number of EFB cankers on the main tree trunk and total length of these cankers/tree was determined on 28 to 20 Jul 2020.

Rainfall for the Oct 2018 to Sep 2019 growing season was approximately 5 inches below the 115 yr average but temperatures were at the average of 59.2°F. March precipitation was 3 in below normal while April was 3 in above normal which led to localized flooding from April 9 to 11 near but not in the experimental area. Hazelnut growth started later than normal but unusually warm and dry weather at the end of April through mid-May accelerated tree growth. Symptom development was early and first noticed on 22 Jun 2020 as sunken cankers with a few white stroma emerging. Although overall disease pressure was normal, no rain occurred during the last 2 weeks of April and thus no spores were caught during that period (Figure 1). Highest number of cankers per tree were found on non-treated trees, however, the number of cankers found on trees treated with Aprovia, Pyraziflumid 20, or Gatten were not significantly different. Several fungicide treated trees did not develop cankers including those treated with Merivon, Quadris Top, Inspire Super, Miravis Duo (A20259G), and VJR84-R001. The low number of cankers found on trees treated with TopGuard, Cevya (BAS-75007), or BAS-75202 were not significantly different from zero. Fungicides in FRAC group 7 such as Aprovia and Pyraziflumid 20, or have activity mainly for Botrytis such as Luna Tranquility or specific to powdery mildews such as Gatten have not done well in past experiments as well as in this one. No phytotoxicity was observed on any of the treated trees.

Figure 1. Ascospore counts from bud swell through shoot elongation, 2019 growing season.



Treatment and Rate/100 gal water	Number of Applications ^X	Ave Number of Cankers/Tree ^Y	Total Canker Length/Tree ^Y (cm)
Non-treated	0	3.8 a	59.6 a
Merivon at 6.5 fl oz plus Induce at 16 fl oz.....	4	0.0 d	0.0 c
Quadris Top at 14 fl oz plus Induce at 16 fl oz.....	4	0.0 d	0.0 c
Inspire Super at 16 fl oz plus Induce at 16 fl oz.....	4	0.0 d	0.0 c
Aprovia at 5.5 fl oz plus Induce at 16 fl oz.....	4	2.8 abc	42.0 ab
Miravis Duo (A20259G) at 13.7 fl oz + Induce at 16 fl oz.....	4	0.0 d	0.0 c
Miravis Prime (A20560E) at 9.1 fl oz + Induce at 16 fl oz.....	4	1.3 c	20.6 b
TopGuard at 14 fl oz plus Induce at 16 fl oz.....	4	0.1 d	1.5 c
TST98-R006 at 3.5 fl oz plus Induce at 16 fl oz.....	4	2.1 bc	31.9 ab
VJR84-R001 at 7 fl oz plus Induce at 16 fl oz.....	4	0.0 d	0.0 c
Cevya (BAS-75007) at 3 fl oz plus Induce at 16 fl oz.....	4	0.1 d	0.9 c
Cevya (BAS-75007) at 5 fl oz plus Induce at 16 fl oz.....	4	0.1 d	1.1 c
BAS-75202 at 5 fl oz plus Induce at 16 fl oz.....	4	0.3 d	2.5 c
BAS-75202 at 7 fl oz plus Induce at 16 fl oz.....	4	0.1 d	0.9 c
Pyraziflumid 20 SC at 3.1 fl oz plus Induce at 16 fl oz.....	4	2.3 ab	41.0 ab
Luna Tranquility at 27 fl oz plus Induce at 16 fl oz.....	4	1.9 bc	29.0 ab
Gatten at 10 fl oz plus Induce at 16 fl oz.....	4	2.1 abc	31.3 ab
Instill at 30 fl oz plus Induce at 16 fl oz.....	4	1.9 bc	23.6 b

^X Fungicide treatments were applied on 26 Mar 2019 (bud break), 9 Apr 2019, 23 Apr 2019, and 7 May 2019 for a total of 4 applications.

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