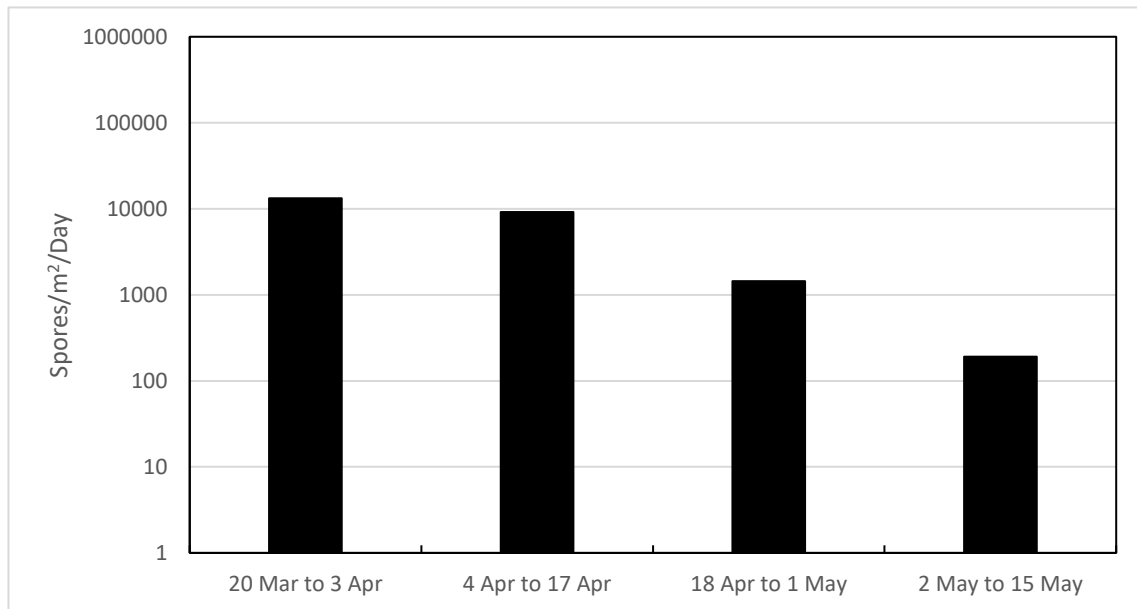


**Evaluation of fungicides for management of eastern filbert blight, 2018 - 2019.**

Healthy appearing two-year-old 'Ennis' hazelnut trees were planted from 5 to 7 Feb 2018 at the Botany and Plant Pathology Field Laboratory, Corvallis, OR. Limbs with EFB cankers were cut from heavily diseased trees during Jan and Feb 2018. A total of 300 cankered limbs were placed above test trees on chicken wire frames supported by a wooden trellis, on 1 Mar 2018. Treatments were arranged in a randomized complete block design. Each treatment consisted of 8 single tree replicates, however, analysis based on 7 reps due to a single tree death (missing data) in one of the 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 20 Mar 2018 (bud break), 3 Apr 2018, 17 Apr 2018, and 1 May 2018 for a total of 4 applications. The first application for MasterCop and Kocide was on 26 Mar 2018. The first application of Gatten was made on 3 Apr after material was received. Makaze (3%) was applied as a general and/or spot treatment on 9 Apr, 7 May, 2 Jul, and 14 Aug 2018 for management of weeds. Trees were fertilized with 46-0-0 at a rate of 0.5 lb/6 trees on 26 Apr 2018 and 8 Apr 2019. Sucker were managed by hand cutting on 29 Apr 2019 and 26 Jul 2019. Supplemental irrigation was provided as needed during the 2018 growing season. The number of EFB cankers on the main tree trunk and total length of these cankers/tree was determined on 5 to 9 Aug 2019.

Spring weather conditions for 2018 were considered normal until early May when frequent rainfall tapered off quickly. Symptom development was first noticed on 1 Jul 2019 as sunken cankers with a few white stroma emerging. Overall disease pressure was more normal as indicated by spore counts (Figure 1) and canker development found on non-treated trees. Highest number of cankers per tree were found on non-treated trees, however, the number of cankers found on trees treated with Luna Privilege, Aprovia, or F9944-74 were not significantly different. Several fungicide treated trees did not develop cankers including those treated with Indar, the low rate of Aproach, Miravis Duo (although one tree developed 1 canker in the replicate that was dropped from the analysis) and Kocide 3000. The low number of cankers found on trees treated with Quadris Top, the high rate of Aproach, F4406-1, or the high rate of MasterCop were not significantly different from zero. No phytotoxicity was observed on any of the treated trees.

Figure 1. Ascospore counts from bud swell through shoot elongation, 2018 growing season.



Treatment and Rate/100 gal water	Number of Applications <sup>X</sup>	Ave Number of Cankers/Tree <sup>Y</sup>	Total Canker Length/Tree <sup>Y</sup> (cm)
Non-treated .....	0	4.9 a	102.3 a
Quadris Top at 12 fl oz plus Induce at 12 fl oz.....	4	0.1 e	1.1 e
Indar 2F at 6 fl oz plus Induce at 12 fl oz.....	4	0.0 e	0.0 e
Approach 2.08 SC at 8 fl oz plus Induce at 12 fl oz.....	4	0.0 e	0.0 e
Approach 2.08 SC at 12 fl oz plus Induce at 12 fl oz.....	4	0.1 e	1.9 e
Approach 2.08 SC at 8 fl oz plus Indar 2F at 6 fl oz plus Induce at 12 fl oz.....	4	0.0 e	0.0 e
Approach 2.08 SC at 12 fl oz plus Indar 2F at 6 fl oz plus Induce at 12 fl oz.....	4	0.0 e	0.0 e
Luna Privilege at 6.84 oz plus Induce at 12 fl oz.....	4	3.4 ab	72.0 ab
Aprovia at 5.5 fl oz plus Induce at 12 fl oz.....	4	3.4 ab	63.0 ab
Miravis Prime (A20560) at 9.1 fl oz + Induce at 12 fl oz.....	4	3.0 bc	74.1 abc
Miravis Duo (A20259) at 13.7 fl oz + Induce at 12 fl oz.....	4	0.0 e	0.0 e
F4406-1 at 5.6 fl oz plus Induce at 12 fl oz.....	4	0.3 e	2.9 e
F9944-74 at 5.7 fl oz plus Induce at 12 fl oz.....	4	4.0 ab	84.3 ab
Vivando at 15 fl oz .....	4	2.7 bc	54.4 bc
Gatten <sup>x</sup> at 10 fl oz .....	3	2.6 c	59.1 c
MasterCop <sup>x</sup> at 6 pt.....	4	1.0 d	13.4 d
MasterCop <sup>x</sup> at 9 pt.....	4	0.3 de	1.4 e
Kocide 3000 <sup>x</sup> at 7 pt plus Supreme Oil at 1 pt/100 gal .....	4	0.0 e	0.0 e

<sup>X</sup> Fungicide treatments were applied on 20 Mar 2018 (bud break), 3 Apr 2018, 17 Apr 2018, and 1 May 2018 for a total of 4 applications. The first application for MasterCop and Kocide was on 26 Mar 2018. The first application of Gatten was made on 3 Apr after material was received.

<sup>Y</sup> 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 ( $P=0.05$ ).