

HAZELNUT (*Corylus avellana* ‘Ennis’)
 Eastern filbert blight; *Anisogramma anomala*
 Filbert Bud Mite; *Phytocoptella avellanae*

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Evaluation of Ziram for management of eastern filbert blight, 2020 - 2021.

Healthy appearing two-year-old ‘Ennis’ hazelnut trees were planted from 29 to 31 Jan 2020 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 2020. A total of 285 cankered limbs were placed above test trees on chicken wire frames supported by a wooden trellis, on 4 Mar 2020. 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 31 Mar 2020 (after bud break), 14 Apr 2020, 28 Apr 2020, and 11 May 2020 for a total of 4 applications. (Trial was started late due to late arrival of fungicides due to Covid issues with manufacturer.) Makaze (3%) was applied alone as a general and/or spot treatment on 28 May, then tank mixed with Forfeit 280 (1.7 oz/gal) on 6 Jul and 12 Aug 2020 and 24 Jun 2021 for management of weeds. Trees were fertilized with 46-0-0 at a rate of 0.5 lb/6 trees on 26 Mar 2020 and 24 Apr 2021. Suckers were managed by hand cutting on 29 Jun 2020 and 14 Jul 2021. Supplemental irrigation was provided as needed during the 2020 and 2021 growing season. The number of filbert bud mite blasted buds was determined on 3 May 2021. The number of EFB cankers on the main tree trunk and total length of these cankers/tree was determined on 26 to 29 Jul 2021.

After half the normal rainfall during the dormant season, spring 2020 weather conditions were considered normal to wet. Symptom development was first noticed on 28 May 2021 as slightly sunken cankers with bumps in rows indicating growth but not emergence of stroma. Squirrel damage to the base of some trees was also observed but did not interfere with symptom development or data collection. Highest number of cankers per tree (or total canker length) were found on non-treated trees. Trees treated with TopGuard did not develop cankers which was not significantly different from the number of cankers found on trees treated with Ziram Xcel. The data suggest good kickback activity with TopGuard considering that the first application was 2 week after bud break. There was no difference in the number of filbert bud mite blasted buds among any of the treatments. No phytotoxicity was observed on any of the treated trees.

Treatment and Rate/100 gal water	Number of Applications *	Ave Number of Cankers/Tree**	Total Canker Length/Tree** (cm)	Ave Number of Blasted Buds/Tree**
Non-treated	0	2.1 a	33.4 a	15.4
Ziram 76 DF at 4 lb plus Induce at 12 fl oz.....	4	0.9 b	13.3 b	24.4
Ziram Xcel at 4 lb plus Induce at 12 fl oz.....	4	0.3 bc	3.0 bc	13.5
Ziram Xcel at 6 lb plus Induce at 12 fl oz.....	4	0.3 bc	6.0 bc	18.1
TopGuard SC at 14 fl oz	4	0.0 c	0.0 c	19.3
Ziram 76 DF at 4 lb plus TopGuard SC at 14 fl oz	4	0.0 c	0.0 c	17.0

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** 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 ($P=0.05$). Means without letters do not differ.