

**Evaluation of Ziram and Thiram 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. 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. 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/tree 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 and canker development found on non-treated trees. Highest number of cankers per tree were found on non-treated trees which was significantly more than the number of cankers found on fungicide treated trees. Cankers did not develop on trees treated with either Bravo Weather Stick or Thiram, however, the number of cankers on trees treated with 4 applications of Ziram were not significantly different. Although no phytotoxicity was observed in trees treated with any of the various materials used, Ziram left a white residue on the trees. The addition of Induce or Stick-It with Ziram did not statistically reduce the number of EFB cankers that developed on trees treated with Ziram alone.

Treatment and Rate/100 gal water	Number of Applications *	Ave Number of Cankers/Tree**	Total Canker Length/Tree** (cm)
Non-treated .....	0	5.1 a	132.8 a
Bravo Weather Stik at 32 fl oz.....	4	0.0 d	0.0 d
Ziram 76 DF at 4 lb .....	4	0.1 cd	0.9 cd
Ziram 76 DF at 4 lb plus Induce at 12 fl oz.....	4	0.1 cd	3.6 cd
Ziram 76 DF at 4 lb plus Stick-It at 6 fl oz.....	4	0.1 cd	0.6 cd
Ziram 76 DF at 4 lb plus Induce at 12 fl oz Alternate with Trionic at 3 fl oz plus Induce at 12 fl oz .....	2	0.8 bc	10.5 bc
Thiram 24/7 at 3.1 qt.....	4	0.0 d	0.0 d
Trionic at 3 fl oz plus Induce at 12 fl oz .....	4	0.8 b	11.0 b

\* Fungicide treatments were applied on 20 Mar 2018 (bud break), 3 Apr 2018, 17 Apr 2018, and 1 May 2018.

\*\* 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 ( $P=0.05$ ).