

HAZELNUT (*Corylus avellana* ‘Jefferson’)
 Bacterial Blight; *Xanthomonas arboricola* pv. *corylina*

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Evaluation of copper-based products for control of bacterial blight on hazelnut, 2024.

Young trees were harvested from tie-off layering beds in mid-November 2022 and planted out from 20 Feb to 3 Mar 2023 in rows 162 long x 4 feet wide. Bactericide treatments were arranged in a randomized complete block design where each treatment consisted of 24 single tree replicates. Trees were blocked based on overall plant health with 11 replicates consisting of more stressed plants, while the remaining 13 consisted of less stressed plants. Bactericides 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 1.25 liters of a spray suspension was used per 24 trees within each treatment. Bactericide treatments were applied on 20 Oct 2023. Trees were then inoculated on 30 Nov 2023 with two isolates of *Xanthomonas arboricola* pv. *corylina*. Inoculum was prepared using 0.5 g of freeze-dried cells of JL2005 (phylogroup of type strain) and 0.5 g of JL2600 (phylogroup 2) suspended and rehydrated in 1 liter of water for 60 minutes. This suspension and water was then added to a Stihl SG20-Pump-Style backpack sprayer to 10 liters for a final concentration of about 1×10^8 cfu/ml. The cell suspension was applied to treatment trees until bark was visibly damp or wet on a morning with temperatures in the low 40s with 0.32 inches of rain within 24 hours after application. At the time of inoculation, tree defoliation was $\geq 95\%$. A set of 24 trees were not inoculated to serve as control trees in each block. In 2023, weeds were managed by applying Rely 280 (1.7 oz/gal) as a general and/or spot treatment on 17 Jul. In 2024, weeds were managed by applying Casuron 4G as a general pre-emergent on 8 Mar, Ranger Pro (4 fl oz/gal) was applied on 24 Apr and Lifeline (1.7 fl oz/gal) was applied on 12 Jul. Trees were monitored for symptoms of bacterial blight during the spring and early summer of 2024. The number of dead buds/shoots per tree was determined on 15 Jul 2024.

In 2023, there was 5.95 inches of rain from bactericide application to inoculation. Rainfall during the dormant season (Oct 2023 to Mar 2024) was 4.1 inches above normal. Symptoms of bacterial blight started to develop on 13 May 2023 as random dieback of buds and a few shoots. Some trees died due to Pacific flatheaded borer (*Chrysobothris mali*) damage and as a result blocks that contained those trees were not used in the final analysis. Overall, very little disease developed even on non-treated inoculated trees. There were no differences in the number of dead shoots among the various treatments in 2024.

Treatment and Rate/100 gal water	Dead shoots per tree 2024 ^Y	Dead shoots on subset of trees with drought symptoms in 2023 ^Z
Non-treated and non-inoculated	0.0	0.0
Non-treated but Inoculated.....	0.3	0.3
Previsto at 4 qt then Inoculated	0.8	0.8
Badge X2 at 10.5 lb plus Stylet Oil at 1 pt then Inoculated	0.3	0.0
Badge SC at 10.5 pt plus Stylet Oil at 1 pt then Inoculated	0.2	0.2
Kocide 3000 at 10.5 lb plus Stylet Oil at 1 pt then Inoculated	0.0	0.0

^Y Analysis of variance is based on log (x+1) transformation of only 22 replicates. Means followed by the same letter do not differ significantly based on Fisher’s protected LSD ($P=0.05$). Means without letters are not significantly different.

^Z Analysis of variance is based on log (x+1) transformation of only 9 replicates of trees with drought symptoms during the previous summer of 2023. Means followed by the same letter do not differ significantly based on Fisher’s protected LSD ($P=0.05$). Means without letters are not significantly different.