

Evaluation of soil injected fungicide for management of hazelnut kernel mold, 2021.

The objective of this trial was to determine if soil injection of flutriafol could result in less kernel mold at harvest. Treatments were arranged in a randomized block design in a commercial block of (non-irrigated) Santiam alternated with Lewis hazelnuts (double density) located near Carlton, OR. Only Santiam trees were treated. Each treatment consisted of 8 single tree replicates. The diameter of trees 1 to 2 feet above ground was determined 7 Apr. The fungicide TopGuard Terra (42% flutriafol) was injected into the soil around trees using an HTI 2000 Soil Injector connected to a Maruyama MS75 backpack power sprayer. The nozzle end of the injector was inserted 4 inches into the soil prior to horizontal injection of the fungicide solution. The amount of fungicide solution injected was based on the diameter of each tree where 250 ml of solution was injected per inch diameter. For example, 4 separate injection sites were evenly distributed within the drip zone of a tree 4 inches in diameter. The grower’s standard herbicide, insecticide and fertility program was implemented during the course of this trial. Nuts were allowed to fall naturally onto bare soil and collected just prior to first commercial harvest. A total of 400 nuts were obtained from under each tree on 10 Sep. A set of 200 nuts from each tree was cracked open and evaluated for kernel defects from 16 to 21 Sep. Another set of 200 nuts from each tree of each selection was rinsed with tap water, rinsed with 10% bleach (Clorox), rinsed again with tap water then incubated on wet orchard soil within moist chambers where nuts were always in contact with wet soil. Orchard soil was collected dry from the field and allowed to sit open in a greenhouse exposed to ambient temperature (68-74°F) and low humidity. This air-dried soil was placed into moist chambers and saturated by adding water until visibly saturated. After 2 weeks incubation in the greenhouse, nuts were rinsed and allowed to air dry for 24 hours, then cracked open with a hammer and evaluated for kernel defects. Scoreable “mold” included any kernel with visible mycelial growth.

Spring rainfall was well below average and an unusual climate change related heat dome (heat wave) occurred for 3 days in late June with temperatures at or above 100°F. This resulted in the second driest (first was in 1924) and second hottest (first was in 2015) growing season ever recorded. Average diameter of treated trees was 4 inches. There were no significant differences in kernel mold, discoloration or shrivel between non-treated and fungicide treated trees at harvest or after 2 weeks incubation on wet soil. Both the incidence of kernel mold and discoloration was significantly higher after 2 weeks incubation on wet soil. Shrivel, however, was less after 2 weeks incubation on wet soil. No phytotoxicity was observed in any of the treated trees. Due to the dry spring it is suspected that there was little uptake of fungicide into treated trees.

Treatment & Rate/injection	Kernel Mold Incidence (%)*		Discoloration Incidence (%)*		Shrivel Incidence (%)*	
Non-treated at harvest.....	1.2	b	3.1	b	5.8	ab
TopGuard Terra at 10 ml/injection at harvest...	1.0	b	3.2	b	8.8	a
Non-treated after 2 weeks on wet soil	11.6	a	6.8	a	4.0	b
TopGuard Terra at 10 ml/injection after 2 weeks on wet soil	12.1	a	6.3	a	4.6	b

* Means followed by the same letter do not differ significantly based on Fisher’s protected LSD ($P=0.05$). Means without letters are not different.

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