HAZELNUT (*Corylus avellana* 'Lewis')
Kernel Mold; *undetermined fungi*

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Effect of moisture on kernel mold development, 2016.

The purpose of this trial was to determine the effect of high humidity and soil moisture on the development of kernel mold in hazelnut.

Nuts from a commercial 'Lewis' orchard were mechanically harvested on 15 Sep 16, placed into gunnysacks and stored at 40° F. Nuts were surfaced sterilized with 10% bleach for 1 min and allowed to air dry at ambient room temperature (65° to 70°) on paper towels. Nuts were then placed into plastic moist chambers onto either a wire mesh screen (3 inches above the bottom) or onto a 4 inch layer of orchard soil. Although nuts were in a single layer on screens or soil, many were touching each other. Nuts were incubated for 14 days on wire screens within moist chambers either dry (with lids off and open to the lab) or humid (lids on with wet paper towels on the bottom of the chamber) where nuts were not in contact with the wet towels. Nuts were also incubated on orchard soil within moist chambers either dry (with lids off and open to the room) or wet (lids on with water saturate soil). In these later cases, nuts were always in contact with either air-dried or wet soil. Orchard soil was collected from the field and dried by allowing it to sit open in the laboratory exposed to ambient temperature and low humidity. Drying was accelerated by oven drying half the soil at 40^{o}C for 16 hours, cooling back to room temperature for 4 hours and then mixing it back in with the rest of the soil. This air-dried soil was placed into moist chambers and saturated by adding water until visibly saturated. Moist chambers were then carefully tipped onto their sides to pour off any excess water. Sets of 200 nuts per moist chamber were replicated 8 times for each of 4 treatments for a total of 1,600 nuts per treatment. The experiment was repeated twice. After 2 weeks incubation at ambient room temperature, nuts were cracked open with a hammer and evaluated for kernel defects. Scoreable "mold" included any kernel with visible mycelial growth.

Lowest mold was associated with nuts incubated on either wire screens or soil that were kept dry. Highest mold was associated with wet soil and was significantly higher than mold found on nuts incubated on air-dried soil or either wire screen treatments. Just keeping nuts at high humidity (wire screens – humid) without direct contact with moisture was enough to significantly increase mold. Future tests will investigate sterilized soil and various levels of soil moisture.

Treatment[Z]	Mold (%)[Y]	
	Experiment 1	Experiment 2
Wire Screens - Dry	7.1 c	6.2 c
Wire Screens - Humid	10.7 b	20.8 b
Orchard Soil - Dry	6.9 c	7.8 c
Orchard Soil - Wet	31.1 a	46.3 a

[Z] Wire Screens Dry = nuts were incubated on wire screens with moist chamber lids off and open to the lab, Wire Screens Humid = nuts were incubated on wire screens with wet paper towels on the bottom of the chamber, Orchard Soil Dry = nuts were incubated on air-dried soil with moist chamber lids off, Orchard Soil Wet = nuts were incubated on water saturate soil.

[Y] Means followed by same letter do not differ significantly based on Fisher's protected LSD (P=0.05).

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