

**How time and location affect kernel defects, 2012.**

The objective of this trial was to determine if kernel mold increases after nuts come in contact with the soil. A block of 4 hazelnut selections (379.050, 380.057, 385.013, and 391.001) planted in 1994 on a 10 x 20 ft spacing at the Botany and Plant Pathology Field Laboratory, Corvallis, OR was selected for this trial due to a consistent high production of moldy kernels. Treatments were arranged in a randomized complete block design. Each nut location treatment was applied to 4 single trees on each of 2 hazelnut selections (379.050 and 380.057). The orchard floor under trees was cleared and prepared for nut drop by blowing old nuts and debris with a leaf blower into the grass strip between trees, mowing weeds and using an herbicide to prevent new weed emergence during the summer. Fertilizer and insecticides were not used. Nuts were allowed to fall onto bare soil, weed cloth or screens suspended 6 inches off the ground with cinder blocks. Nuts were harvested periodically from bare ground before (2 and 12 Oct) and after (18 and 26 Oct) the start of the fall rains, cracked open without drying and evaluated for kernel defects. A total of 70 to 100 nuts without filbert worm damage were collected from under each tree on 29 to 30 Oct, dried at 100°C for 48 hours, cracked open and evaluated for kernel defects. Scoreable “mold” included any kernel with visible mycelial growth (associated with *Cladosporium cladosporioides* in the past). Scoreable discoloration included kernels with only black areas on the kernel. Total tip discoloration included any kernel with black or red discoloration of the distal end of the kernel (associated with *Ramularia* sp in the past).

Weather conditions in Western Oregon were normal to wet in the spring and then abnormally dry during the summer until 12 Oct when the fall rains returned. Collection of nuts for either selection was hampered by extremely high filbert worm counts and bird predation. Selection 380.057 also had significantly high blank counts (Table 1 and 2). Overall, selection 379.050 generally had more “Mold” and total tip discoloration than selection 380.057. Scorable “Mold” increased for selection 379.050 by the last evaluation date while it did not for selection 380.057. Discoloration or black tips did not significantly increase for either selection. Total tip discoloration increased for selection 379.050 by the last evaluation date.

Within each selection there was no effect on kernel defects if nuts sat on bare ground, weed cloth or elevated screens. Mold seems to be more affected by rainfall and moisture than contact with soil.

Table 1. Evaluation of kernel defects over time.

Hazelnut Selection and Time of Harvest	Mold (% kernels)*	Discoloration (%)*	Blanks (%)*	Black Tips (%)*	Red Tips (%)*	Total Tip Discoloration (%)*
Hazelnut Selection 379.050						
2 Oct	18.3 b	2.8 c	1.8 c	3.0 b	16.8 b	19.8 b
12 Oct	21.5 b	1.8 c	1.8 c	3.5 b	8.6 c	12.1 bc
18 Oct	20.3 b	1.0 c	1.3 c	2.3 b	19.0 b	21.3 b
26 Oct	30.6 a	2.6 c	2.1 c	5.4 b	27.5 a	33.0 a
Hazelnut Selection 380.057						
2 Oct	5.5 c	9.0 ab	27.9 a	12.1 a	4.3 c	16.4 bc
12 Oct	7.2 c	9.7 a	23.0 ab	14.0 a	2.9 c	16.9 bc
18 Oct	8.9 c	10.0 a	17.1 b	13.2 a	5.8 c	18.9 b
26 Oct	3.3 c	4.9 bc	26.5 a	5.7 b	1.6 c	7.3 c

\* Means were not significantly different based on Fisher’s protected LSD (P=0.05).

Table 2. Nut location effect on kernel defects.

Hazelnut Selection and Nut Location Prior to Harvest	Mold (% kernels)*	Discoloration (%)*	Blanks (%)*	Black Tips (%)*	Red Tips (%)*	Total Tip Discoloration (%)*
Hazelnut Selection 379.050						
Nuts on bare soil.....	27.0 a	2.0 bc	1.8 b	3.3 b	23.5 a	26.8 a
Nuts on weed cloth.....	25.0 a	0.5 c	2.5 b	4.0 b	17.8 a	21.8 ab
Nuts on suspended screens.	24.8 a	1.3 bc	1.3 b	3.3 b	18.5 a	21.8 ab
Hazelnut Selection 380.057						
Nuts on bare soil.....	4.3 b	4.8 b	30.1 a	5.3 ab	2.8 b	8.1 c
Nuts on weed cloth.....	2.5 b	8.9 a	31.0 a	9.5 a	3.6 b	13.2 c
Nuts on suspended screens.	6.3 b	9.5 a	29.0 a	9.8 a	6.0 b	15.8 bc

\* Means were not significantly different based on Fisher's protected LSD (P=0.05).