

**FEEDING DAMAGE BY BROWN MARMORATED STINK BUG (*HALYOMORPHA HALYS*) ON COMMERCIAL HAZELNUT (*CORYLUS AVELLANA*)**

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Insects of the family Pentatomidae, commonly called stinkbugs or shield bugs, are serious pests of many food and ornamental crops around the world. Included in those crops are almonds, pistachios, pecans and macadamia nuts. Commercially produced hazelnuts (*Corylus avellana* L.) grown in the Willamette Valley are currently not economically impacted by pentatomids. However, the rapid spread of *Halyomorpha halys*, brown marmorated stink bug (BMSB) in the area could potentially impact hazelnut growers, as wild hazelnuts are a known host of BMSB. Research into the potential damage that BMSB could cause to hazelnuts is needed so that management methods can be developed. This research includes categorizing symptoms of damaged nuts at different stages of development. A preliminary study done during the summer of 2011 showed that BMSB will feed on and damage cultivated hazelnuts. A study will be conducted in 2012 and 2013 to determine the timing of damage occurring in more resolution and to confirm the findings of the previous study. This report includes results of data collected during the 2012 field season.

25 mesh exclusion bags were placed over hazelnut branches containing buds on 9 trees (225 bags total) on May 2, 2012. Trees were located at the USDA Hazelnut Germplasm Repository, Corvallis, OR. Nut development began on June 6, 2012. Three adult male BMSB were placed in a single bag per tree and allowed to feed on developing nuts for one week per bag (branch) before being removed. This was repeated weekly for 16 weeks during nut development, until nuts matured. Unused bags were treated as control bags and were unexposed to BMSB feeding. If adult males were unavailable, 5<sup>th</sup> instar nymphs were used. Bags were collected in early October. Nuts were unshelled in the lab and examined for signs of feeding damage which was categorized based on preliminary trials the previous season: healthy (no apparent damage), blanks (no kernel), shriveled (small or malformed kernel), corking (internal dry, white necrotic tissue) and oily (darker internal regions of kernel). Clusters of developing hazelnuts (n >10 clusters per tree) were collected weekly and frozen in order to determine the average state of development for each cultivar at the time of experimental insect feeding. Trials will be repeated in 2013.

Our data indicate some trends in the timing of feeding damage. Early season feeding appears to result in blank hazelnuts (Fig. 1), compared to corking damage, which was significantly greater during the last week of the season compared to earlier weeks (Fig. 3). The mean number of nuts with shriveled or

malformed damage was significantly greater for a short period mid-season (Fig. 3). Damage timing will be further compared to timing of nut development by classifying development stages from the frozen nuts to account for variations in cultivar development and to accumulated degree-days. High amounts of variation in the number of nuts per bag that were exposed to BMSB feeding will be corrected in experimental methods for 2013.

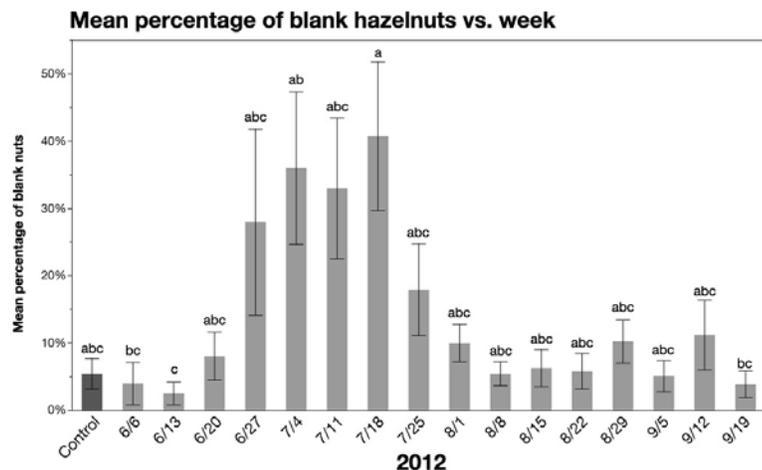


Figure 2: Mean percentage of blank hazelnuts per week, 2012. Treatments with differing letters indicate significant difference, Error bars = SE (arcsine transformation, Tukey’s HSD, JMP 2012) Figure shows untransformed data.

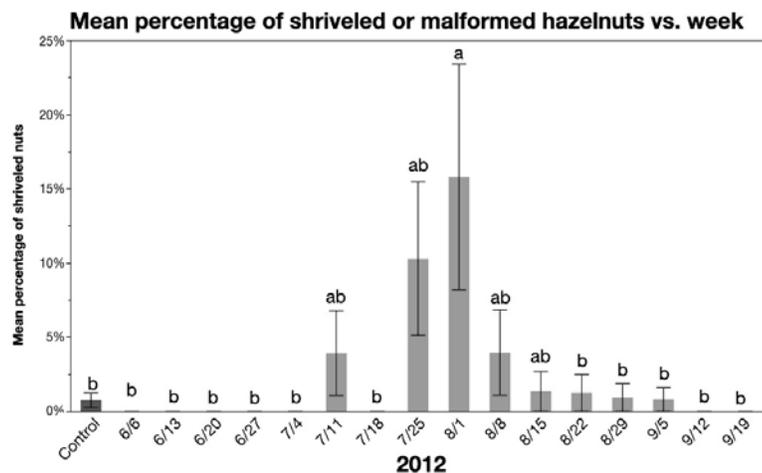


Figure 3: Mean percentage of shriveled hazelnuts per week, 2012. Treatments with differing letters indicate significant difference, Error bars = SE (arcsine transformation, Tukey’s HSD, JMP 2012) Figure shows untransformed data.

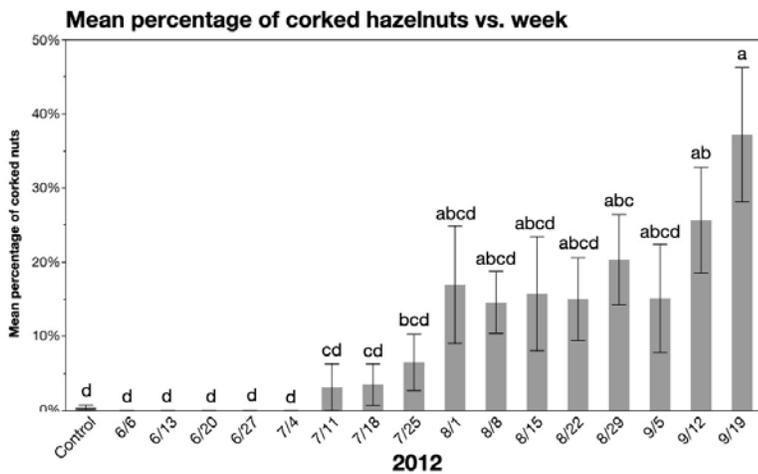


Figure 4: Mean percentage of blank hazelnuts per week, 2012. Treatments with differing letters indicate significant difference, Error bars = SE (arcsine transformation, Tukey's HSD, JMP 2012) Figure shows untransformed data.

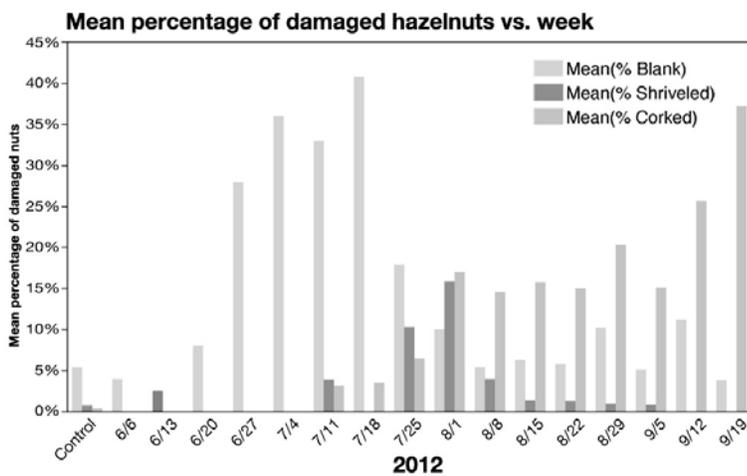


Figure 5: Summary of mean percentage of varying types of feeding damage by BMSB on hazelnuts in 2012.