

How to Recognize Brown Marmorated Stink Bug Damage in Commercial Hazelnuts



Photo by Chris Hedstrom, © Oregon State University

Figure 1. *Halyomorpha halys* prepares to feed on a mature hazelnut. Stink bugs feed using straw-like, piercing-sucking mouthparts that penetrate tissues and inject digestive enzymes, allowing them to feed on many types of plant tissues.

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Brown marmorated stink bug (BMSB; *Halyomorpha halys*) likely entered the United States in the mid-1990s in Pennsylvania via a shipping container. It has since spread throughout the United States. BMSB was first detected in Oregon in 2004 in the Portland area, and has spread throughout the Willamette and Columbia River valleys over the last decade. This insect is now found in commercial agricultural areas. When disturbed, the insect releases volatile defense compounds that have an unpleasant odor—hence its name.

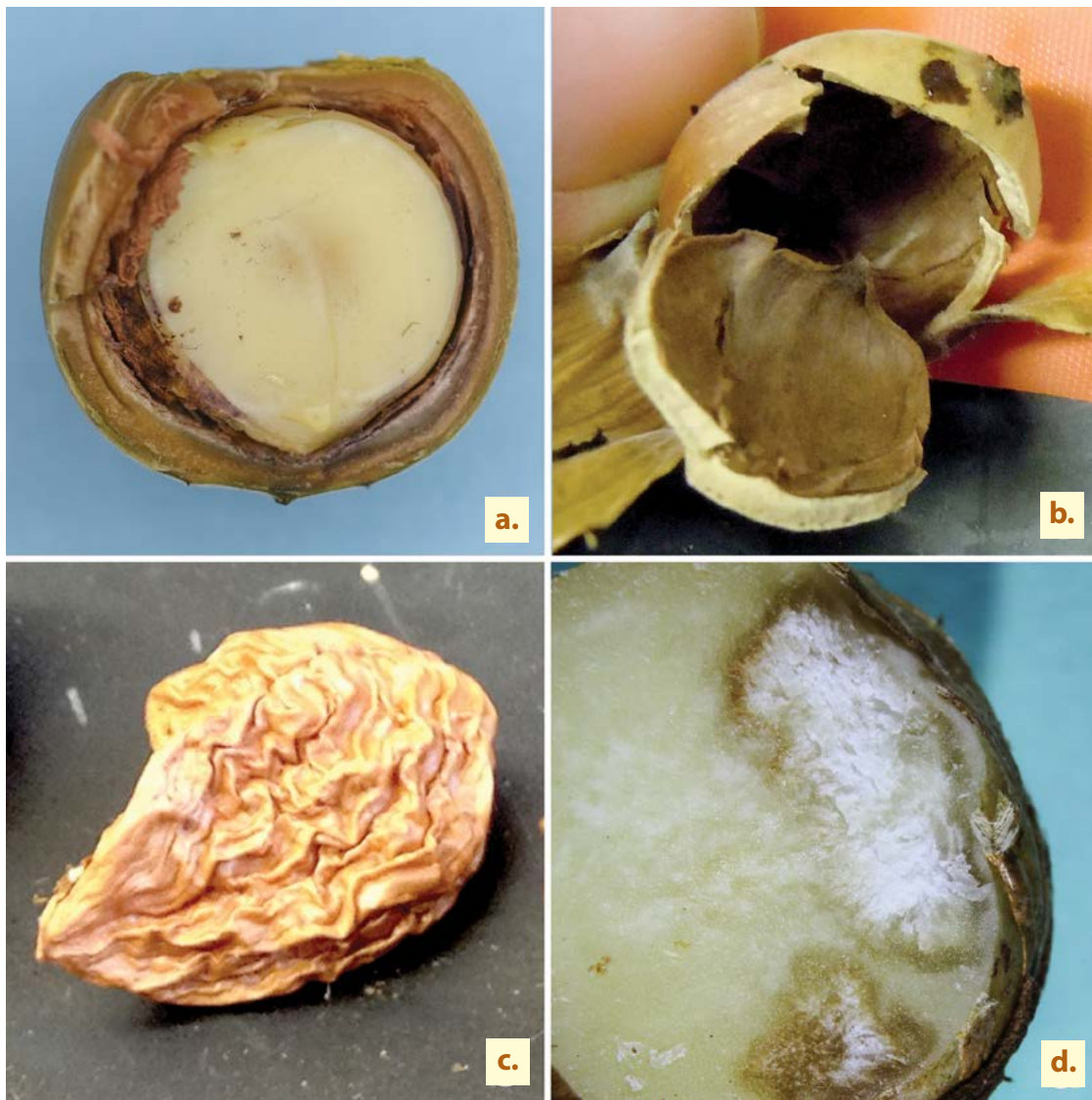
In urban areas, BMSB is considered a nuisance pest. It aggregates in and on buildings, and can feed on ornamental and garden plants. In agricultural areas, it is a serious pest because it feeds on a wide variety of host crops. In Oregon, economically important specialty crops, including tree fruits, tree nuts, berries and grapes, vegetables, and ornamentals, can be damaged. The Willamette Valley produces virtually all commercial hazelnuts (*Corylus avellana* L.) grown in the U.S. BMSB was

first observed in Oregon hazelnut orchards in 2012. Although it has been shown to feed on hazelnuts, significant economic damage to hazelnuts from BMSB has yet to be documented in Oregon. France, Italy, and Turkey have all reported economic damage to hazelnut crops from other species of stink bug.

BMSB egg masses and immature life stages have been observed in hazelnut orchards, suggesting that BMSB can complete its life cycle on hazelnuts alone.

This publication will help growers and field scouts learn how to recognize damage to hazelnuts

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Figure 2. Primary damage symptoms associated with kernel feeding by BMSB on hazelnut kernels: a. healthy kernel (in shell); b. blank nut (empty shell); c. shriveled kernel; d. corking damage.

from BMSB adults and to determine at which stage of nut development the damage occurred. The BMSB life cycle includes five immature stages. Four of these nymph stages can damage crops. In addition to feeding directly on nuts, immature and adult BMSB may feed on foliage, husks, and other plant parts.

Stink bugs damage hazelnuts when they insert their mouthparts through the shell and into the hazelnut kernel (Figure 1). The amount and type of damage caused depends on the stage of nut development when BMSB feeds. Figure 2a shows a healthy hazelnut, while figures 2b, 2c, and 2d illustrate the types of damage that can occur at different stages of nut development.

- Blanks (Figure 2b) occur when BMSB feeds during shell expansion and causes physiological disruption of hazelnut development. Blank

hazelnuts also are caused by other physiological problems, such as incomplete pollen set or insufficient compatible pollinizers.

- Shriveled or malformed kernels (Figure 2c) result from direct feeding on expanding kernels.
- Corking (Figure 2d) corresponds to direct feeding on mature or nearly mature kernels.

Hazelnuts are susceptible to BMSB damage during all stages of kernel development when stink bugs are present and feeding (Figure 3).

Nut crops with thick husks or shells have shown resistance to feeding by other kinds of insects. However, hazelnut shell thickness does not deter feeding by BMSB adults. Many commercial hazelnut cultivars are likely susceptible to BMSB feeding

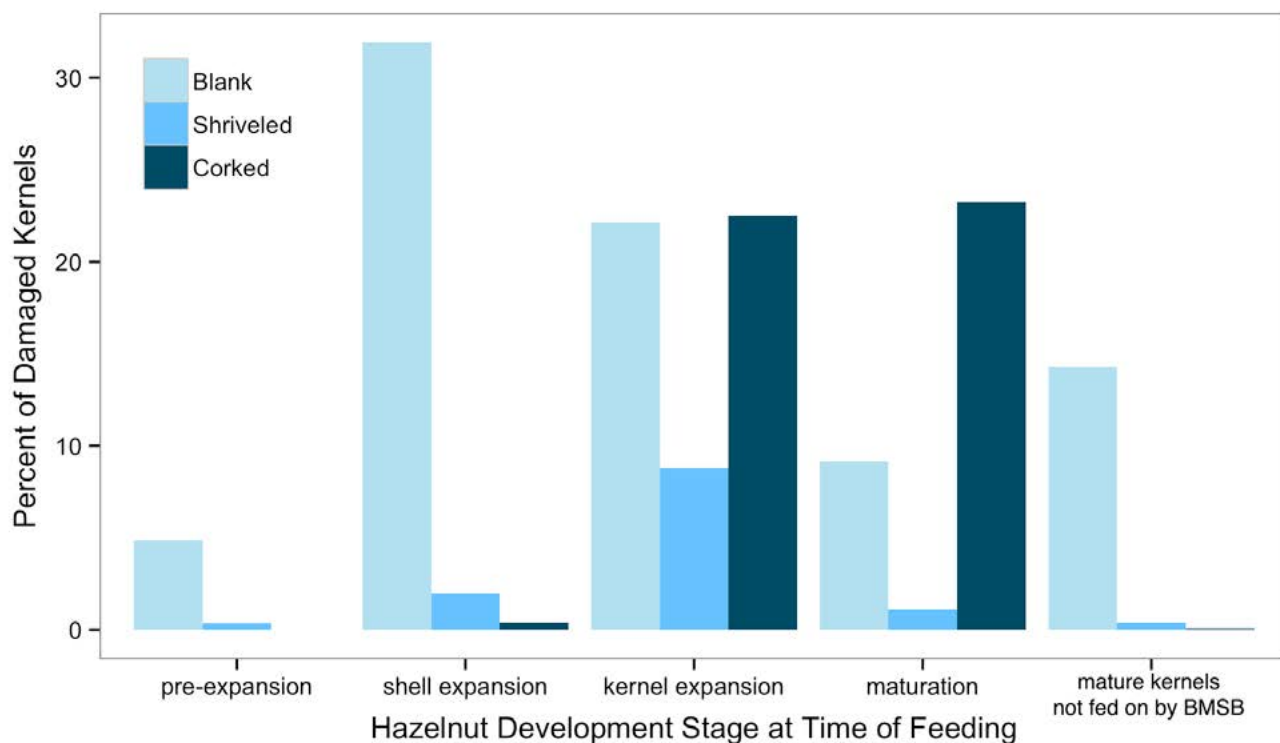


Figure 3. Hazelnut developmental stages and corresponding damage within each developmental period.

damage. Growers should not rely on a cultivar’s shell thickness to deter BMSB feeding.

As BMSB populations and hazelnut acreage continue to increase in the Willamette Valley, the need for an Integrated Pest Management program to control this pest becomes essential. Such an IPM program would include monitoring abundance and accurate identification.

Many native stink bug species have also been observed in hazelnut orchards. Although other stink

bug species would likely cause similar damage to BMSB, native stink bugs are usually present in very low numbers. They are not typically an economic problem in Willamette Valley hazelnut production.

Correct identification of any stink bug observed is important—some are beneficial predators. When possible, collect stink bugs or photograph them for identification by OSU Extension. See EM 9054, *Brown Marmorated Stink Bug*, for identification of BMSB and some look-alike insects.

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