Identification, Biology, and Management of Brown marmorated stink bug *(Halyomorpha halys, Stål)*

Brown marmorated stink bug (*Halyomorpha halys, Stål*) is an invasive pest known to feed on over 300 plants and is a threat to vegetables, fruit, and field crops. It is native to Asia and was first reported in the United States in 1998 in Allentown, Pennsylvania. Since its introduction, it has spread to more than 40 other states. In addition to being an agricultural pest, this stink bug is a nuisance pest with a habit of invading homes in winter in search of overwintering sites.

Identification

The adult brown marmorated stink bug is shield-shaped, measures ½ to ¾ inches in length, and has a mottled brown color. The adult has alternating black and white bands on its antennae and legs and alternating black and white triangular markings on their abdomen (Fig. 1).

Fig. 1 Adult brown marmorated stink bug. Photo credit: Steven Valley, Oregon Department of Agriculture, Bugwood.org.

The eggs are round, white to pale green in color, and are laid in clusters of 20 to 30 on the underside of leaves (Fig. 2).

Fig. 2 The eggs of brown marmorated stink bug. Credit: Jennifer Carr, University of Florida, Bugwood.org.

Newly hatched nymphs have red eyes and a yellowish abdomen (Fig. 3) that eventually turns white with reddish markings.

Fig. 3 A freshly hatched egg mass. Gary Bernon, USDA APHIS, Bugwood.org.

The later nymphal stages develop black and white bands on the legs and antennae (Fig. 4). The nymphs lack functional wings but develop visible wing pads in the last two instars, or molt stages.

Fig. 4 The late instar nymphal stage. Photo credit: Gary Bernon, USDA APHIS, Bugwood.org.

Biology and Life Cycle

This insect has one or two generations per year, depending on the region of occurrence. In most of the Midwest, it has two generations in a year. It has three stages in its lifecycle: egg, nymph, and adult.

The adult emerges from the overwintering sites in spring, and females start laying eggs. In roughly four to five days, the egg hatches into the first instar nymph (Fig. 3). BMSB goes through five molts, or instars, each lasting a week, before adulthood. Adults start looking for overwintering sites, often homes and buildings, September through October.

Host Plants and Damage

This stink bug has a broad range of cultivated and non-cultivated host plants. Their feeding injures the fruits and seeds of various crops, including apples, peaches, apricots, grapes, tomatoes, eggplant, pepper, soybeans, and corn. On vegetables, the feeding injury leads to deformed structures and unmarketable crops. In beans and okras, the feeding injury results in scarred and faded sunken areas on the pods, while in fleshy fruits like tomatoes and pepper, the injury leads to white spongy structures on green tomatoes and yellowish on ripened fruit (Fig. 5). Feeding also causes indirect damage and transmits pathogens, causing fruit rot like brown rot in tomatoes. Feeding on apples and peaches causes a distinct damage known as cat-facing as well as "corky" spots on the fruit (Fig. 6). On field crops like corn, they feed on the kernel through the husk and the nymph feeds on an ear of corn and feed on developing seeds directly through the pod in soybeans. Both cases lead to substantial yield loss.

Fig. 5 Stink bug eggs and damage on tomato. Photo credit: Kacie J. Athey, University of Illinois Urbana-Champaign.

Fig. 6 Adult brown marmorated stink bugs on a peach. Photo credit: Gary Bernon, USDA APHIS, Bugwood.org.

Management

The ground deployed black pyramid trap baited with brown marmorated stink bug pheromone lure and methyl decatrienoate is effective in capturing and monitoring both adults and nymphs throughout the season in the orchard. See the detailed protocol for setting up the trap in the article Monitoring for the Brown Marmorated Sting Bug using pheromone-baited traps.

A simpler alternative for monitoring can be a clear sticky trap (Fig. 7), which is also cost-effective to growers and is outlined in the Fruit Growers News article, Simpler trap for monitoring brown marmorated stink bugs eyed.
Recommendations for insecticide control vary by host crop and can be found in the Fruit Pest Management Guide or the Midwest Vegetable Production Guide.

Fig. 7 A clear sticky trap with brown marmorated stink bug lure. Photo credit: Kacie J. Athey, University of Illinois Urbana-Champaign.

Authors

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References

Leskey, T. C., & Nielsen, A. L. (2018). Impact of the invasive brown marmorated stink bug in North America and Europe: history, biology, ecology, and management. Annual Review of Entomology, 63, 599-618.

Sparks, M. E., Bansal, R., Benoit, J. B., Blackburn, M. B., Chao, H., Chen, M., ... & Gundersen-Rindal, D. E. (2020). Brown marmorated stink bug, Halyomorpha halys (Stål), genome: putative underpinnings of polyphagy, insecticide resistance potential and biology of a top worldwide pest. BMC genomics, 21, 1-26.

Rice, K. B., Bergh, C. J., Bergmann, E. J., Biddinger, D. J., Dieckhoff, C., Dively, G., ... & Tooker, J. F. (2014). Biology, ecology, and management of brown marmorated stink bug (Hemiptera: Pentatomidae). Journal of Integrated Pest Management, 5(3), A1-A13.

Fruit grower news. 2019. Simpler trap for monitoring brown marmorated stink bugs eyed.
Available fruitgrowersnews.com/news/simpler-trap-for-monitoring-brown-marmorated-stink-bugs-eyed/

Midwest Fruit Pest Management Guide 2023-2024.
Available ag.purdue.edu/department/hla/extension/_docs/id-465.pdf

Jaime C. Piñero. Monitoring for the Brown Marmorated Sting Bug using pheromone-baited traps.
Lincoln University IPM program. ipm.missouri.edu/pestMonitoring/bmsb/images/Monitoring_for_the_Brown_Marmorated_Sting_Bug.pdf

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