

# The Brown Marmorated Stink Bug (*Halyomorpha halys*)

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## IPM Garden Center Fact Sheet—March 2011

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Initially reported around Allentown, Pennsylvania, the brown marmorated stink bug (BMSB), or *Halyomorpha halys* (Stal), has become a crop pest and household nuisance throughout Maryland and adjacent states. Native to Asia, BMSB is thought to have arrived through shipping material and is now established throughout the Mid-Atlantic and parts of the West Coast. This invasive species is an excellent hitchhiker and has entered over half of the contiguous United States.



### Life cycle

As BMSB is a relatively new pest, we are still learning about the pest's life cycle. Entomologists have reported one generation per year in Pennsylvania and New Jersey, but West Virginia researchers have seen 2 generations a year (Nielsen and Hamilton 2010, Holtz and Kamminga 2010).

A warmer climate speeds the BMSB development process, and life stage development depends on daylight and temperatures. In BMSB's native habitat, research suggests 4-6 generations per year. The following life history facts are based on the BMSB life history in Pennsylvania. Stay tuned to University of Maryland Extension updates and the IPM Pest Alert which go out every Friday from March through October. We will post additional life cycle information as the research continues.

The eggs are light green to almost white in color and are laid in clusters of 25-30. Eggs are often on the underside of leaves and can be found from May through August. Over time, a female BMSB can deposit over 200 elliptical-shaped eggs. Monitor for these eggs by examining the undersides of foliage.

The BMSB nymph has five instars, or juvenile development stages. The nymph ranges from 2.4 mm to 12 mm in length. Nymphs are characterized by dark reddish eyes and a yellowish-red abdomen with black striping. The antennae of the nymphs are similar to adults—black with white banding. Pennsylvania's nymph population peaks in July and August, while adult populations are highest in September.



**Left to Right:** Egg, 1<sup>st</sup> instar, and 3<sup>rd</sup> instar BMSB.

Photos courtesy of George C. Hamilton, Rutgers School of Environmental and Biological Sciences

BMSB overwinters as an immature adult in houses and other structures. They are typically inactive during the winter months, but indoor heating has kept many stink bugs moving this year. Stink bugs re-enter the landscape

in the spring where they continue to mature, mate, and lay eggs. Expect to see heightened stink bug activity in March and April as they move outdoors.

### **Feeding Habits**

BMSB consumes a wide variety of plant species and feeds primarily on the reproductive organs of a plant such as the fruit or seed pod. Growers have reported this pest feeding on fruit, leaves, stems, and other plant parts as well. In Maryland, BMSB is reported to feed on apples, pears, peaches, sweet corn, soybeans, tomatoes, peppers, cucumber, eggplants, berries, chrysanthemums, zinnias, sunflowers, and several woody plants.

BMSB feeds throughout the nymph and adult stages by sucking on plant material. Discoloration and dimples result at the feeding site. Reports indicate that BMSB damage alters the taste of fruits and vegetables. Heavy populations of BMSB can devastate a commercial or backyard crop.

### **Protecting Your Indoor Plants**

University of Maryland Extension has received reports of BMSB feeding on indoor plants and seedling vegetables such as tomato and pepper this winter. We suspect that this is due to higher metabolic rates in an indoor heated environment. A cheese cloth or other light-penetrating barrier will protect plugs and small vegetables. Stink bugs should be heading outside toward warmer weather in March and April.

### **Dealing with BMSB in Houses**

The stink bugs are driving most people crazy this winter as they wander around the house. The insect is designed to overwinter as an immature adult and has enough energy reserves to last through winter if they remain inactive. Warm houses often result in active BMSB which uses valuable energy reserves. If they continue to walk around in winter, they often run out of energy and die.

Indoor control options are limited. Some people are so enraged by the presence of BMSB that they purchase insecticides not labeled for indoor use and spray house surfaces. This is an unwise practice that exposes individuals to potentially harmful insecticides. Still, many feel they must do something to kill BMSB.

Brush BMSB into a container of soapy water to rapidly kill the stink bug. Another effective method is to vacuum the BMSB adults. The vacuum bag may smell like BMSB. To eliminate odors, empty the vacuum bag after each vacuuming or using a canister-style shop vacuum. We have received reports that portable battery-operated vacuums increase mobility and success in BMSB eradication. Using stink bug traps indoors may capture BMSB, but there has been no standardized testing of their efficacy at this point.

Spraying insecticide around a house or in the interior exposes the user and residents to unnecessary chemicals. For pesticide applications made indoors, there are a limited number of products available. Professional Pest Control Operators (PCOs) must be licensed to apply material in residential homes.

### **Outdoor Control Options**

Biological control options are limited. Praying mantises and chickens are reported to eat the insect, as are assassin bugs. Unfortunately, local predators and parasites have not effectively controlled BMSB thus far.



USDA researchers are working to isolate the BMSB pheromone or attractant. This could help to capture BMSB. AgBio, Inc. indicated that a trap lure would be available in March. Many manufacturers will have products to sell this season, but we cannot comment on trap effectiveness at this time. Although traps have been used to monitor BMSB populations, they have not been tested as a control option.

Since BMSB is a new pest, no truly effective control program has been applied in the United States. Few traditional and even fewer reduced-risk pesticide applications have been effective in commercial production. A USDA study reported that kaolin-clay and sulfur rotations reduced BMSB feeding damage on commercially-grown fruit more effectively than traditional chemical sprays. Licensed landscape professionals can use broad spectrum pyrethroids such as bifenthrin for BMSB control. Unfortunately, widespread use can reduce predator and parasite populations in the landscape unless it is selectively applied. Bifenthrin (i.e. - Ortho Home Defense MAX Insect Killer Granules) is available as an outdoor home perimeter spray but is NOT LABELED for use on home and garden plants.

The chart below lists garden products that may repel or kill bugs. While many of these pesticide labels claim to repel or control stink bugs, research suggests that current products provide temporary relief rather than total pest control of BMSB.

Active Ingredient(s): (Chemical)	Example Products: (More products are available, be sure to check for the active ingredient and label requirements)
<b>Azadirachtin</b>	Bonide Grub Beater Insect Control RTS**, AzaMax
<b>Copper sulfate and carbaryl</b>	Bonide Dragoon Dust**
<b>Copper and Sulfur</b>	Bonide Garden Dust
<b>Insecticidal Soap</b>	Bon-Neem Insecticidal Soap RTU
<b>Permethrin</b>	Ortho Bug-B-Gon MAX Garden Insect Killer Dust
<b>Pyrethrin</b>	Bonide Pyrethrin Garden Insect Spray Concentrate, Garden Safe Fruit and Vegetable Insect Killer
<b>Pyretherin, piperonyl butoxide, and clarified hydrophobic extract of neem oil</b>	Fertilome Fruit Tree Spray Concentrate, Fertilome Triple Action Plus RTU, Green Light Fruit Tree Spray, Green Light Neem II RTU

\*\*Not labeled for use in DC

Read labels thoroughly before making any application. Insects are easiest to control in juvenile stages, so we suggest targeting nymphs rather than the adults. It is best to time these applications when the eggs have hatched and BMSB nymphs are present on the plant material, typically in the summer months (see section on life cycle).

### For the Future

USDA- APHIS is evaluating four parasitic wasps that lay eggs into the eggs of brown marmorated stink bugs. The parasitic wasps are very small and are “stingless” to humans. Researchers found several parasitic wasps in China that are in the genus, *Trissolcus* (Hymenoptera: Scelionidae), that parasitized the brown marmorated stink bug eggs. These species (*Trissolcus mitsukurrii*, *T. plautiae*, *T. flavipes*, and *T. halyomorphae*) will be evaluated in quarantine labs in Delaware over the next two years to

make sure they do not have an adverse impact on other beneficial bugs. If they prove promising at this point, they will be available for release for brown marmorated stink bug release sometime after 2013. In the lab, several species are providing over 80% parasitism of BMSB eggs. This rate of parasitism may be lower if and when they are released into the outside environment. This biological control offers the best long term potential control.

## References

- . 2010. Brown Marmorated Stink Bug Working Group Meetings. Collaborative meetings with USDA-ARS, Extension representatives from the Mid-Atlantic, and commercial growers.
- Aldrich, J., A. Khimian, and M.Camp. 2009. Semiochemically based monitoring of the invasion of the brown marmorated stink bug and unexpected attraction of the native green stink bug (*Heteroptera: Pentatomidae*) in Maryland. *Florida Entomologist* 92: 483-491.
- Gill, S., Klick, S., and Kenney, S. 2010 Brown marmorated stink bug (*Halyomorpha halys*). IPM Pest Alert October 2010. University of Maryland Extension, <http://www.ipmnet.umd.edu/nursery/docs/BMSB-UMD.pdf>
- Hamilton, G.C. 2010. Email Correspondence. Rutgers University, Department of Entomology: Pest Management Office. September 13, 2010.
- Holtz, T., and Kamminga, K. 2010. Qualitative analysis of the pest risk potential of the brown marmorated stink bug (BMSB), *Halyomorpha halys* (Stal), in the United States. United States Department of Agriculture: APHIS.
- Jacobs, S. 2010. Brown Marmorated Stink Bug Fact Sheet. Pennsylvania State University, College of Agricultural Sciences, Department of Entomology <<http://ento.psu.edu/extension/factsheets/brown-marmorated-stink-bug>>.
- Nielsen, A.L., and Hamilton, G.C. 2009. Life history of the invasive species *Halyomorpha halys* (Hemiptera: Pentatomidae) in Northeastern United States. *Ecology and Population Biology* 102(4): 608-616.
- Office of the Secretary. 2010. "Stink Bugs Becoming a Homeowner Nuisance and Agricultural Menace." Maryland Department of Agriculture <[http://www.hgic.umd.edu/content/documents/09-15-10stinkbugsMDApressrelease\\_000.pdf](http://www.hgic.umd.edu/content/documents/09-15-10stinkbugsMDApressrelease_000.pdf)>.



**Be sure to read labels thoroughly before making any application.  
The information given herein is supplied with the understanding that no discrimination is intended  
and no endorsement by the University of Maryland Extension is implied.**