



Pest e-alerts



Entomology and Plant Pathology, Oklahoma State University
127 Noble Research Center, Stillwater, OK 74078
405.744.5527

Vol. 19, No. 1

<http://entopl.okstate.edu/pddl/pddl>

1/9/2020

First Record of Brown Marmorated Stink Bug in Oklahoma Eric J. Rebek, State Extension Specialist for Horticultural Insects

In October 2019, we received a specimen of what appeared to be an exotic stink bug species, brown marmorated stink bug (BMSB), *Halyomorpha halys* (Stål) (Hemiptera: Pentatomidae). The insect was collected in Logan County by an entomology student, and its identity was later confirmed as BMSB, making it the first record of this invasive species in Oklahoma. A second specimen was recovered in Stillwater (Payne County) in mid-December (Fig. 1).

Brown marmorated stink bug is native to Asia where it is considered an agricultural pest. First detected in the U.S. in 1996 in Pennsylvania, BMSB is now found in at least 40 states. This pest is a generalist herbivore, feeding on over 100 species of plants including ornamentals and crops of agricultural and horticultural importance. In addition to its status as a plant pest, BMSB is also a nuisance pest as it overwinters indoors, often amassing in large numbers and producing a foul odor.

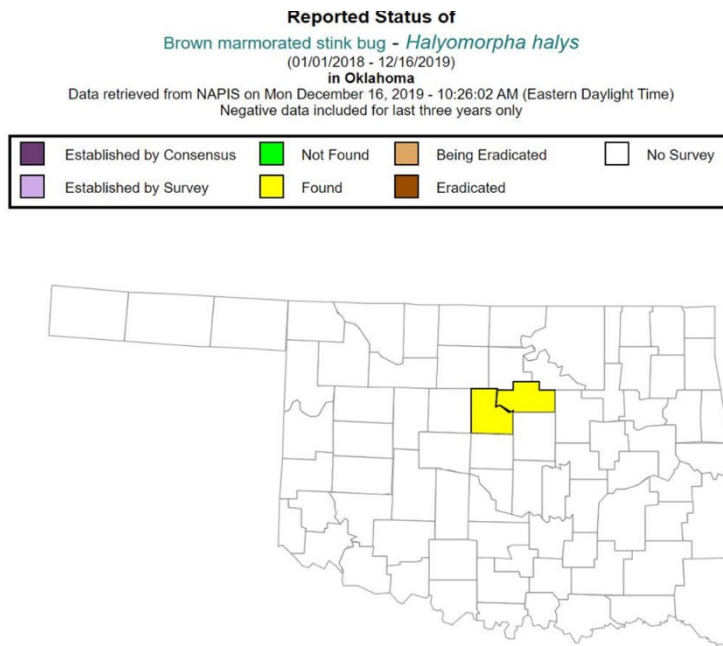


Figure 1. County records for brown marmorated stink bug in Oklahoma. Map generated from NAPIS, December 16, 2019.

Identification and Life History

Brown marmorated stink bug superficially resembles several native stink bug species. However, this insect has white and black banding on the antennae and along the outer margins of the abdomen (Fig. 2), which differentiate BMSB from other stink bugs. Non-reproductive adults overwinter in homes and other buildings as well as natural shelters, especially crevices in trees. Adults measure 0.5 to 0.6 of an inch long and begin to emerge from overwintering sites in early spring. Females mate several times and lay pale green eggs measuring 0.06 inches wide in clusters of 25 to 28 eggs on the underside of leaves (Fig. 3). Eggs turn white just prior to hatching. Neonates (first instars) have black heads with red eyes, and their abdomens are reddish orange with black markings (Fig. 4). Nymphs develop through five instars, and development from egg to adult requires 538 degree days (32-35 days at 86°F) with a minimum and maximum developmental threshold of 57 and 95°F, respectively. Nymphs do not have fully developed wings, but all instars have dark red eyes (Fig. 5).



Figure 2. Adult brown marmorated stink bug. Note black and white banding on the antennae and outer margins of the abdomen. (Photo credit: David R. Lance, USDA-APHIS PPQ, Bugwood.org)



Figure 3. A cluster of brown marmorated stink bug eggs. (Photo credit: David R. Lance, USDA-APHIS PPQ, Bugwood.org)



Figure 4. First instar nymphs of brown marmorated stink bug. (Photo credit: David R. Lance, USDA-APHIS PPQ, Bugwood.org)



Figure 5. Late instar nymph of brown marmorated stink bug. (Photo credit: Steven Valley, Oregon Department of Agriculture, Bugwood.org)

Early instars transition from red to nearly black as they mature, and ultimately turn brown as adults. One to two generations per year have been observed in the invasive range of this pest. However, four to six generations are reported from southern China, so multiple generations are likely in southern regions of its North American distribution.

Hosts and Feeding Injury

Brown marmorated stink bug is highly polyphagous, feeding on over 100 host plants that include tree and small fruits, vegetables, ornamentals, and field crops. This pest feeds on many economically important crops including apple, peach, filbert nut, pear, wheat, hemp, grapes and other small fruit, field and sweet corn, soybean, sorghum, sunflower, pepper, tomato, and eggplant. On these hosts, BMSB preferentially attacks reproductive structures of the plant. Like other stink bug pests, feeding injury by BMSB is characterized by small necrotic areas on leaves and fruit. Injury to fruit may include water-soaked lesions and cat-facing. On ornamental trees, BMSB can use its piercing-sucking mouthparts to penetrate through bark, causing tree sap to accumulate at the feeding site and subsequently attract ants and stinging wasps and bees.

Monitoring and Management

Because BMSB is an invasive species and new to Oklahoma, it is important to delineate where it occurs within the state. Through reliable identification of the pest and subsequent monitoring efforts, we can determine the best approaches to managing this pest in affected crops. An important first step is to reach out to stakeholders in each county, especially homeowners and growers who may be affected. For example, a citizen science approach, complete with training on identification, life history, and ecology of BMSB, has led to new detections in other states dealing with this pest. It is important to follow up on reports from homeowners of bugs invading their homes during the fall and winter, which can help with detecting new infestations of BMSB.



Figure 6. A female samurai wasp, *Trissolcus japonicus*, laying eggs in an egg mass of brown marmorated stink bug. (Photo credit: Chris Hedstrom, Oregon Department of Agriculture)

Management options for BMSB vary with crop, region, and other factors. Chemical control is used extensively in the mid-Atlantic region where outbreaks of BMSB have caused millions of dollars in damage to produce. This spike in insecticide use has disrupted integrated pest management (IPM) programs for other agricultural and horticultural pests in the region. However, research is ongoing for developing IPM methods for BMSB that reduce insecticide use, including improved monitoring strategies. For example, entomologists across the U.S. are studying the effectiveness of an improved trap design that combines a clear, sticky plastic backing and a recently identified aggregation pheromone for this stink bug. Coupled with reliable treatment thresholds that are currently in development, these monitoring traps will enhance estimates of BMSB density in a crop and inform growers of the optimal time to spray to reduce BMSB populations below damaging levels. Another promising area of research is biological control. The samurai wasp, *Trissolcus*

japonicus (Ashmead) (Hymenoptera: Scelionidae), has been identified as a key natural enemy of BMSB. This tiny wasp attacks and develops within BMSB eggs (Fig. 6).

The situation with BMSB in Oklahoma will be updated as we learn more about its occurrence and impact within the state. Meanwhile, if you observe BMSB in your county, please notify Dr. Eric Rebek (eric.rebek@okstate.edu), State Extension Specialist for Horticultural Insects, Mr. Charlie Konemann (gotbugs@okstate.edu), Insect Diagnostician for the Plant Disease and Insect Diagnostic Lab, or contact your local county extension educator.

References

Anonymous. 2019. Simpler trap for monitoring brown marmorated stink bugs eyed. Fruit Grower News, Oct. 2, 2019. <https://fruitgrowersnews.com/news/simpler-trap-for-monitoring-brown-marmorated-stink-bugs-eyed/>

Britt, K.E., M.K. Pagani, and T.P. Kuhar. 2019. First report of brown marmorated stink bug (Hemiptera: Pentatomidae) associated with *Cannabis sativa* (Rosales: Cannabaceae) in the United States. Journal of Integrated Pest Management 10(1): 17, <https://doi.org/10.1093/jipm/pmz014>.

National Agricultural Pest Information System (NAPIS). <https://napis.ceris.purdue.edu/home>.

Rice, K.B., C.J. Bergh, E.J. Bergmann, D.J. Biddinger, C. Dieckhoff, G. Dively, et al. 2014. Biology, ecology, and management of brown marmorated stink bug (Hemiptera: Pentatomidae). Journal of Integrated Pest Management 5(3): A1-A13, <https://doi.org/10.1603/IPM14002>.

Todd, J.L. 2019. Brown Marmorated Stink Bug. National Pest Alert. North Central IPM Center. https://www.ncipmc.org/action/alerts/stinkbug_alert.pdf.

Plant Disease and Insect Diagnostic Lab, Oklahoma Cooperative Extension Service

The pesticide information presented in this publication was current with federal and state regulations at the time of printing. The user is responsible for determining that the intended use is consistent with the label of the product being used. Use pesticides safely. Read and follow label directions. The information given herein is for educational purposes only. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Cooperative Extension Service is implied.

Oklahoma State University, in compliance with Title VI and VII of the Civil Rights Act of 1964, Executive Order 11246 as amended, and Title IX of the Education Amendments of 1972 (Higher Education Act), the Americans with Disabilities Act of 1990, and other federal and state laws and regulations, does not discriminate on the basis of race, color, national origin, genetic information, sex, age, sexual orientation, gender identity, religion, disability, or status as a veteran, in any of its policies, practices or procedures. This provision includes, but is not limited to admissions, employment, financial aid, and educational services. The Director of Equal Opportunity, 408 Whitehurst, OSU, Stillwater, OK 74078-1035; Phone 405-744-5371; email: eeo@okstate.edu has been designated to handle inquiries regarding non-discrimination policies: Director of Equal Opportunity. Any person (student, faculty, or staff) who believes that discriminatory practices have been engaged in based on gender may discuss his or her concerns and file informal or formal complaints of possible violations of Title IX with OSU's Title IX Coordinator 405-744-9154.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Director of Oklahoma Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is issued by Oklahoma State University as authorized by the Vice President, Dean, and Director of the Division of Agricultural Sciences and Natural Resources.