

House Keeping Items

- Restrooms
 - Down the hall on the right
- Food
 - Breakfast
 - Mid- morning and afternoon breaks
 - Lunch

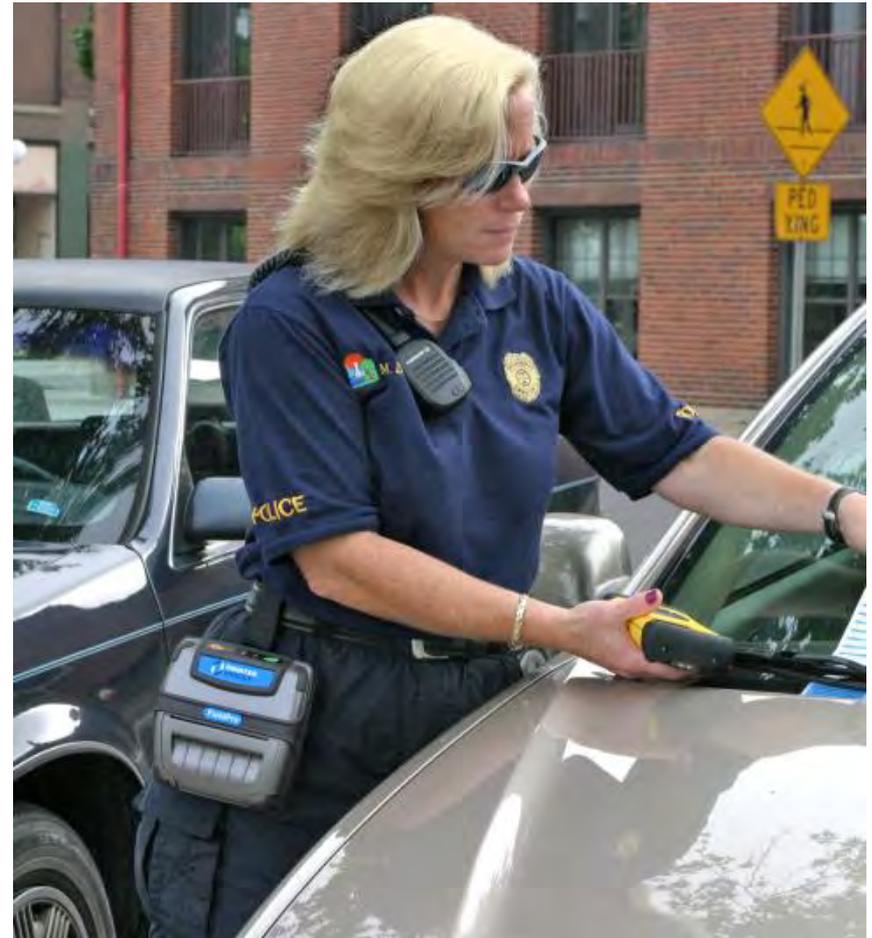


House Keeping Items

- Parking

Use lots 76, 99c & c

Parking elsewhere
will result in a ticket



House Keeping Items

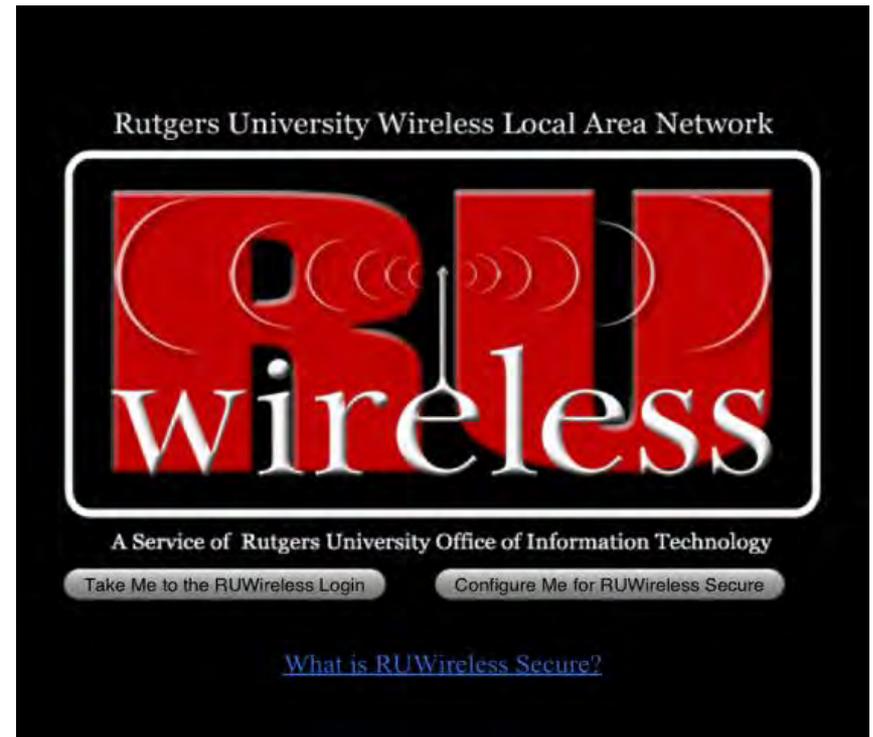
- Internet

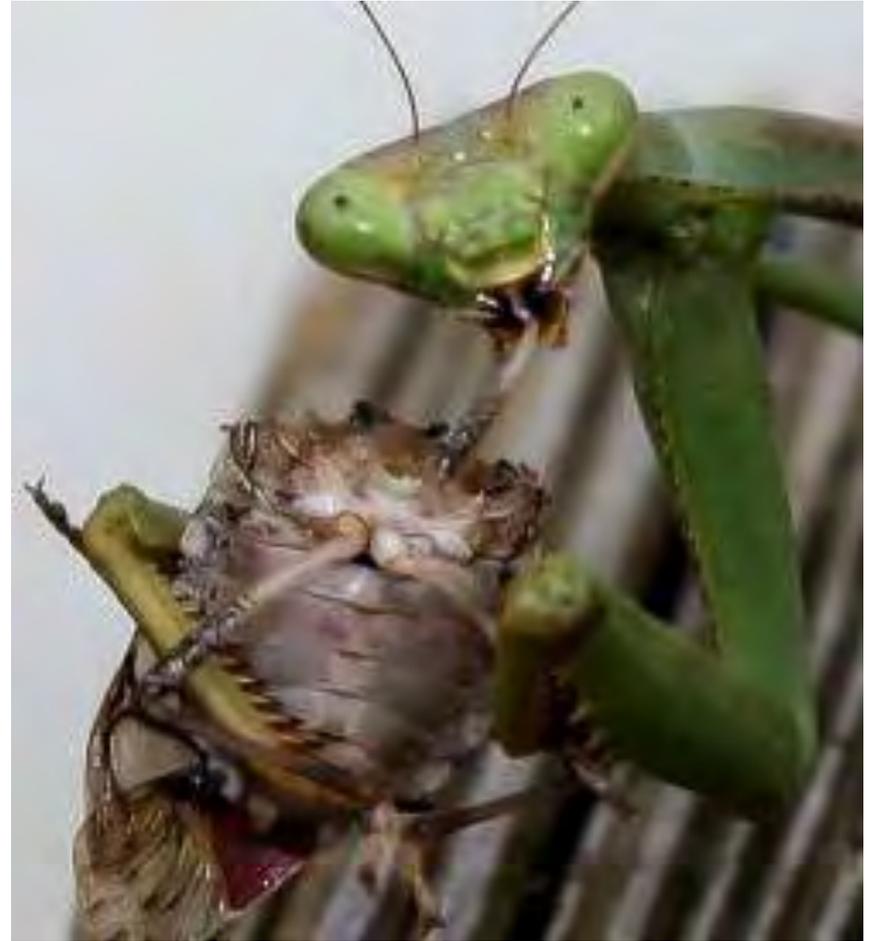
Use RUWireless

Username:
Entomology2016

Password:
Entomology2016

- Unlimited Access





<http://bugoftheweek.com/blog/2013/9/20/death-of-a-stink-bug-part-1-a-curious-reunion-between-the-brown-marmorated-stink-bug-halyomorpha-halys-and-the-chinese-praying-mantis-itinodera-sinensis>

BMSB IPM Working Group Meeting

Meeting Agenda - June 15, 2010

10:30AM - 11:15AM	Registration Begins
11:15AM - 12:00PM	Introductions and Lunch
12:00PM - 6:00PM	Presentations
-7:30PM	Dinner - Dish, Charles Town, WV

Time	Presentation Title
12:00	Brown Marmorated Stink Bug in Pennsylvania - Then and Now... Karen Bernhard, Penn State Cooperative Extension, Lehigh County Agricultural Center, Rm 104, 4184 Dorney Park Road, Allentown, PA 18104
12:20	Spread and Seasonal Occurrence of Brown Marmorated Stink Bug George Hamilton, Rutgers University, Department of Entomology, 93 Lipman Drive, Rutgers University, New Brunswick, NJ 08901
12:40	Assessing the Feeding Injury and Economic Impact of the Brown Marmorated Stink Bug on Soybean Galen Dively, Department of Entomology, University of Maryland, 4412 Plant Sciences Bldg. - College Park, MD - 20742

List of Meeting Participants

NAME	AFFILIATION
Aldrich, Jeff	USDA-ARS
Bergh, Chris	VA Tech
Bernhard, Karen	Penn State Univ
Brown, Mark	USDA-ARS
Cooper, Rick	Cooper Pest Solutions
Day, Eric	VA Tech
Dively, Galen	Univ. Maryland
Hamilton, George	Rutgers Univ
Hamilton, George	Univ. New Hampshire
Hancock, Tom	USDA-ARS
Jacobs, Steve	Penn State Univ
Khimish, Ashota	USDA-ARS
Krawczyk, Greg	Penn State Univ
Kuhar, Tom	VA Tech
Leskey, Tracy	USDA-ARS
Mackintosh, Bill	Crop Prod. Services
Malinoski, Mary Kay	Univ. Maryland
Malone, Sean	VA Tech
Marks, Brandon	Clarian Hotel
Matthews, Clarissa	Red Bud Farms
Miller, Steve	USDA-ARS
Orr, Mark	Orr Bros. Tree Fruit
Polk, Deane	Rutgers Univ
Raup, Mike	Univ. Maryland
Short, Brent	USDA-ARS
Talman, Kathy	USDA-ARS
Taylor, Phil	USDA-ARS
Whalen, Joanne	Univ. Delaware
Wright, Starker	USDA-ARS
Zhang, Aijun	USDA-ARS

June 16, 2016
Rutgers University, Cork Campus
Center, New Brunswick, NJ

INSTANT SYMPOSIUM

Brown Marmorated Stink Bug

George C. Hamilton

The brown marmorated stink bug, *Halyomorpha halys* (Stål), is an exotic stink bug introduced into the United States in 1996 in Allentown, PA (Hoebeke and Carter 2003) (Fig. 1). It is speculated that the introduction occurred through the movement of bulk containers shipped from either the port of Philadelphia or Elizabeth, NJ to Allentown. Initially, *H. halys* was incorrectly identified as a local species; however, after several years of increasing homeowner complaints about large numbers of *Halyomorpha* entering homes in late fall, Karen Bernhard of the Lehigh County Cooperative Extension Service sent specimens to Cornell University for ID confirmation in 2001. Upon their receipt, Richard Hoebeke correctly identified the specimens as the brown marmorated stink bug, thereby establishing the first known report of this insect in the United States. Following proper identification, USDA-APHIS PPQ and others began monitoring the spread of *H. halys*. The first specimen collected in New Jersey was in 1999 from a blacklight trap maintained by the Rutgers Cooperative Extension Vegetable IPM Program. This collection from Milford, NJ, which is 15 miles east of Allentown, was set aside and not identified until notification about the presence of *H. halys* in Pennsylvania in 2001.

Hoebeke and Carter (2003) describe the life history and morphological characteristics of the species. Overwintered females begin laying light green egg masses on the undersides of host plants in late May and continue to do so throughout the summer. *Halyomorpha halys* nymphs pass through five instars. Newly emerged nymphs, orange and black in color, congregate around and feed on the egg mass (Fig. 2). Subsequent instars are black, white, and pinkish in color with white and black bands on the legs and antennae. These bands become more pronounced as the nymphs develop (Fig. 3). Adults have a marbled or marmorated brown coloration, with alternating light and dark bands on the antennae and legs and the lateral margins of the abdomen.

In Japan and China, *H. halys* is reported to have a very wide host range that includes tree fruit and soybeans (Hoebeke and Carter 2003). Watanabe (1996) discussed *H. halys* feeding damage on cherry in Japan. Funayama (1996) found that damage was heavier in early

and mid-harvest apple cultivars in Japan. In Korea, *H. halys* is the dominant pest species of *Citrus junos* Sieb. ("Yuzu" or Japanese citron), causing black concave spots on fruit during the fruit enlargement and yellowing period (Choi et al. 2000). *Halyomorpha halys* has also been observed causing damage on apricots, peaches, and plums (Watanabe 1996, NPAG 2001). Frequently hundreds of *H. halys* have been observed on individual fruit and ornamental trees (Hamilton and Nielsen, unpublished data). Berson (2004) reports that in addition to apples, peaches and pears, *H. halys* has been found feeding on at least 20 ornamental trees and shrubs, including crabapple, Norway maple, paulownia, and roses. Specimens have also been collected feeding on tomatoes, peppers, asparagus fronds, raspberry, grapes, and soybeans.

Since its initial establishment in Allentown, *H. halys* has spread throughout Pennsylvania and into New Jersey northern Delaware, Maryland, and Virginia. In Pennsylvania, *H. halys* has been documented in 23 counties, with the majority of the infestation occurring in eastern and south-central counties. However, *H. halys* is present in two western counties, Beaver and Allegheny. In New Jersey, the brown marmorated stink bug has spread to 14 of 21 counties. Six



Fig. 2. First instar nymphs of *Halyomorpha halys*.



Fig. 1. Adult *Halyomorpha halys*.



Fig. 3. Late instar nymph of *Halyomorpha halys*.

Schedule

- **9:00 AM -10:00 AM – Welcome and Regional Pest Status Updates**
 - *10:20 AM -10:30 AM– Morning Break*
- **12:00 PM -1:00 PM– Working Lunch and Discussion**
- **12:05 PM -1:05 PM – Lunch, Multi-State Meeting and Regional/Canadian Pest Status Updates**
- **1:00 PM – 2:40 PM – Biological Control Presentations**
 - *2:40-2:55 – Group Discussion*
 - *2:55 PM – 3:10 PM – Break*
- **3:10 PM – 3:40 PM – BMSB Nuisance Survey Results**
- **3:40 PM – 5:00 PM – Priority Ranking and Concluding Discussion**

BMSB IPM Working Group History

- Leskey and Hamilton submitted mini-grant application in late 2009 (funded).
- First meeting held in June 2010.
- Second meeting held in November 2010.
- Funded continuously since 2010. Held two meetings per year.
- This is our 13th meeting.



Building A Collaborative Team and Identifying Priorities



We promote and fund integrated pest management for environmental, human health, and economic benefits.



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 - Marmorated Stink Bug
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Brown Marmorated Stink Bug IPM Working Group

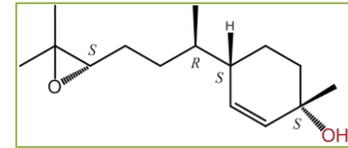
Funded in 2010 and 2011, this working group has established itself as the primary platform for facilitating and coordinating research and outreach efforts for [Brown Marmorated Stink Bug](#) (BMSB) across the United States. The group hosts formal meetings on BMSB at which members share the latest research results and field observations and established research and extension priorities. Participants include researchers, extension personnel, growers, pest control operators, and a hotel manager. [Learn about this working group's plans for 2011-12.](#)



Research Priorities



Studies of BMSB
Biology, Behavior
and Ecology



Identification of
Aggregation
Pheromone



Identification of Effective
Biological Control Agents



Identification of
Effective Insecticides

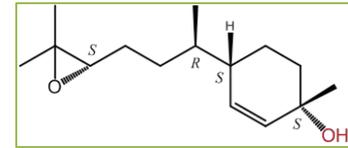


Standardized
Sampling/Monitoring
Techniques

Research Priorities



Studies of BMSB
Biology, Behavior
and Ecology



Identification of
Aggregation
Pheromone



Identification of Effective
Biological Control Agents



Identification of
Effective Insecticides



Standardized
Sampling/Monitoring
Techniques

2014-2016 BMSB IPM WG Objectives

Objective 1. Continue to coordinate other Regional IPM Centers, the NIMSS BMSB Multi-State Project and other affiliated groups to increase networking and reduce duplication of effort.

For this objective, we will utilize the Social Network Analysis Tool to measure strength of collaborations, connections, and contacts within the BMSB IPM Working Group.

Objective 2. Identify and address needs of consumer and pest management professionals.

For this objective, we will use 1) use pre/post survey tools to measure knowledge gained by our BMSB IPM Working Group membership regarding needs of consumer and pest management professionals and 2) pre and post knowledge surveys to measure knowledge gained and IPM practices implemented by pest management professionals through our targeted webinar series.

Objective 3. Update priorities based on outputs generated from a number of extramural projects and pest status in new regions.

For this objective, we will list all stakeholders consulted, generate priorities and provide a description of how priorities were reached

Objective 2. Identify and address needs of consumer and pest management professionals



BMSB Nuisance Pest Survey

Nuisance Problems Caused by Brown Marmorated Stink Bug



Survey for Homeowners and Businesses

The invasive brown marmorated stink bug (BMSB) has caused headaches for homeowners and businesses due to their entry into homes and buildings during the autumn, often in very large numbers, and their entry living spaces throughout the winter and spring.

The BMSB IPM Working Group would like to know more about how you deal with BMSB nuisance problems at your home and/or business. Your responses to our survey will help guide researchers on key issues they should pursue to better combat this problem. Thanks so much for your assistance!

* 1. In what city do you live?

2. Have you had BMSB problems at your home or business?

- Yes
- No. Stop survey.

Open for 6
weeks

>550

responses from
all over the
country

Pre/Post Survey

Knowledge of Needs of Consumers and Pest Management Professionals