Brown Marmorated Stink Bug: Yet another new kid on the block...

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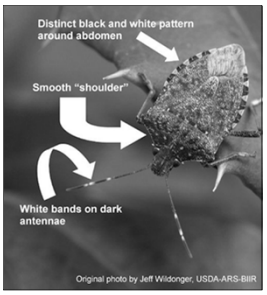
Appearance

Hemiptera: Pentatomidae: *Halyomorpha halys*



- Mottled brown to grey
- ½-¾" long
- Legs are brown and may have faint white bands

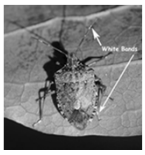
BMSB look-alikes


Acrosternum sp.


Euschistus sp.


Boxelder Bug.


Western Conifer Seed Bug



BMSB


Brochymena

Slide credit Dr. Mike Raupp Univ. Maryland

Confirmation

- If you find or suspect BMSB, please send specimen in alcohol to:
  Insect Diagnostic Lab
  1630 Linden Dr.
  University of Wisconsin
  Madison, WI 53706
- Rutgers University has an active monitoring program for the spread of BMSB
- If you find BMSB, please fill-out and submit a secure, on-line form at: https://njaes.rutgers.edu/stinkbug/report.asp

Life cycle

Eggs

- ~0.06"
- Clusters of 20-30
- Underside of leaves

1st instars

- Bright orange/red
- Black head and thorax
- emerge in 4-5 days

2nd instars

- Very dark
- Tick-like

Slide credit Dr. Mike Raupp Univ. Maryland

Life cycle

3rd to 5th instars


Images from: bugguide.net; Kenneth Frank

Each instar lasts ~1 week

- Reddish to off-white abdomen
- Dark markings center of back and along margins of abdomen
- White bands on legs and antennae

Slide credit Dr. Mike Raupp Univ. Maryland

Biology

- Adults emerge late March-June
- Adults sexually mature in ~2 weeks
- Each female can lay about 250 eggs
- Nymphs tend to be solitary feeders, but often congregate on leaves, bark, or fruit
- New generation of adults begin to appear in mid to late summer

Photo credit Mike Raupp and Galen Dively

Biology

- Probably would be only 1 generation in WI (1 in NJ, 2 in WV)
- Feeding increases at night (0-4AM)

Photo credit Mike Raupp and Galen Dively

Overwintering and pest status

- Adults overwinter in protected locations - natural rocky outcroppings, houses and structures, in bark of dead standing trees
- Adults sheltering in homes active on warm days in late winter (active in March this year in Madison!)

Photo credit Phil Pelliterri

Slide credit Dr. Mike Raupp Univ. Maryland

Overwintering

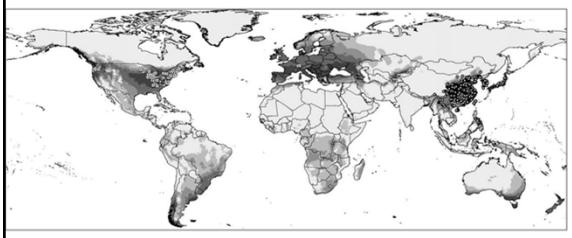
- Adults overwinter in large (>7.5" dbh) dry dead standing trees with loose and peeling bark
- Hide beneath bark or inside decomposed woody tissue
- Dogs used for detection!
- Favored hosts: oak, locust, tree of heaven, elm
- Stink bugs found in leaf litter, but no BMSB
- Edge effect and early season hosts surrounding crops (maple, catalpa, redbud, walnut, mulberry, cherry, black locust…)

Introduction

Native from Asia (China, Korea, Japan)

Probably came to US on shipping boat in 1996 (Allentown, PA)

Potential geographic distribution



Dark color represents high suitability

Zhu et al. 2012 PlosOne 7:e31246

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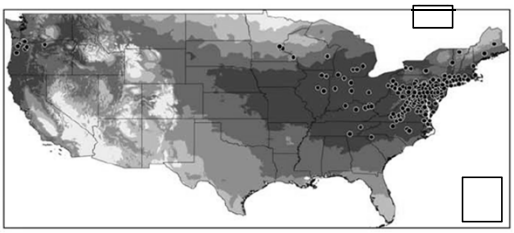

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Actual distribution

As of December 2015, BMSB has been detected in 42 states

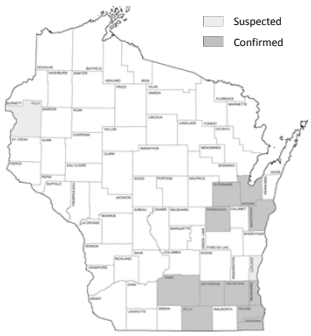
Distribution in Wisconsin

2010: First detection (car)

2011: First report in Dane and Jefferson counties

2012: Breeding populations reported in several counties

2015: No nuisance or agricultural problem reported, but numbers increasing in urban areas



Host plants

Significant agricultural pest in some areas of the eastern US

- Tree fruits: apple, peach, cherry, pear,…
- Vegetables: peppers, tomatoes, asparagus…
- Fruits: berries, grapes, currant, melons,…
- Field crops: soybeans, corn,…
- Trees: maple, crabapple, oak, black cherry (feeds through the bark)

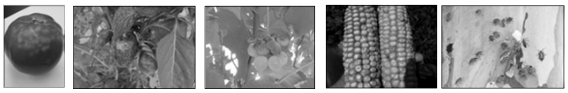


Photo credit Mike Raupp

Management options

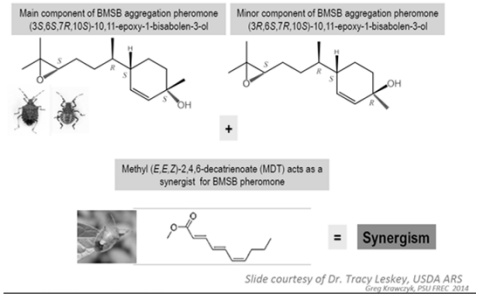
- Population monitoring and trapping
- Chemical control
- Biological control

Population monitoring

- Scouting: edge effect, higher abundance in border rows, adjacent to woods especially
- Research on border row sprays in NJ
- Season-long monitoring now possible with pheromone traps
- Light traps also tested

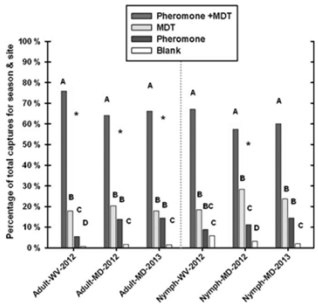
BMSB chemical attractants

BMSB aggregation pheromone and *Plautia stali* aggregation pheromone



BMSB chemical attractants

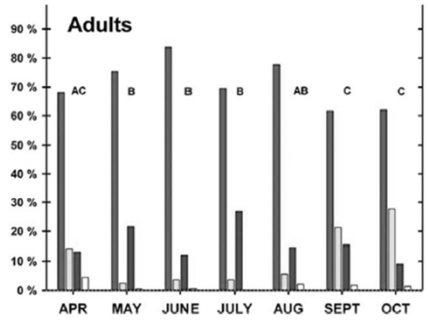
Synergism of pheromone and MDT works all season and for adults and nymphs



Weber et al. 2014. Journal of Economic Entomology 107: 1061-1068

BMSB chemical attractants

Proportion of trap catches throughout season



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BMSB traps

Dead-Inn pyramid trap
Ag Bio
$35/trap

Experimental trap
USDA-ARS

RESCUE® Stink Bug Trap
Great Lakes IPM
$20/trap with attractant
Light attachement $17.30

DEAD-INN Stink Bug Trap and Box
$24.95 from EcoGreen Warehouse

Lure from Ag Bio
$6 per lure

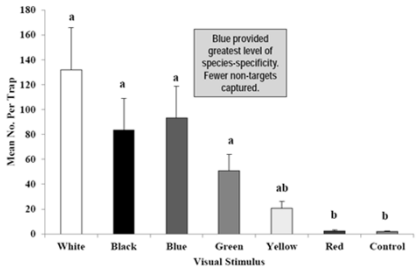
BMSB light traps

Experimental trap
USDA-ARS

Leskey et al. 2012 Report on attraction of BMSB to pheromone lures and light traps

BMSB light traps

Tests of different light waves and frequencies for BMSB specificity



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Chemical control

Class	Trade name	Active ingredient	PHI (days)	Probable efficacy
Neonicotinoid	Actara	Thiamethoxam	35	+++
	Belay	Clothianidin	7	++++
Pyrethroid	Baythroid	β-cyfluthrin	7	+++
	Danitol	Fenpropathrin	14	+++
Carbamate	Lannate	Methomyl	14	++
Organochlorin	Endosulfan	Endosulfan	21	+++

Follow the label, it is the law!!

Biological control

Native parasitoids and predators:

- *Telenomus podisi* (Hymenoptera: Scelionidae) native to U.S.
- *Trissolcus japonicus*: egg parasitoid, primary BC agent responsible for management of BMSB in northern China: 50% mortality rate for BMSB populations. Not known in U.S.
- Predation of eggs in U.S. by Carabidae and Harpalus (ground beetles), Salticids (spiders), earwigs, Tettigoniidae (bush crickets).

Telenomus podisi

Trissolcus japonicus

Biological control

https://www.youtube.com/watch?v=rbdXiiM538I

QUESTIONS???

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