

The Brown Marmorated Stink Bug (BMSB) is a significant threat to US agriculture. The goal of this large, multi-state research project is to identify management tactics that will integrate a whole-farm, organic approach for BMSB management.

Important Findings

1. Habitat Manipulation

Sorghum and sunflower are attractive trap crops. Deployment of both as a combined planting surrounding peppers can slow the injury to peppers.

2. BMSB Dispersal Behavior

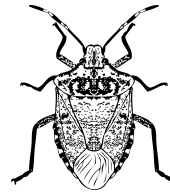
Adults and nymphs have a high capacity for movement. Nymphs and adults select host plants based on plant phenology. Crops are most attractive during fruit set and fruit maturation. Overwintering BMSB adults are highest on houses bordering agricultural and woodland habitats on dark colored houses.

3. Impact of Natural Enemies

Biological control against BMSB is low, even on organic farms. However, supporting natural enemies through the provision of floral resources through insectary strips has preliminarily shown to increase predation of BMSB eggs. Video surveillance and lab feeding trials have determined that katydids, spiders, grasshoppers, and earwigs may have the greatest impact on BMSB eggs.

4. Organic Management Tools

White fine mesh row covers can prevent stink bugs from feeding on peppers, but may be cost effective only under high population pressure. Organic insecticides have varying efficacy on BMSB management, with Veratran D and Azera having the greatest impact on adult BMSB. These insecticides had no significant impact on the natural enemy community in the field.



Our Collaborators

Project Director:

Dr. Anne L. Nielsen, Rutgers University

On-farm experiments:

Muth Family Farm (NJ), Terhune Orchards (NJ), Rodale Institute (PA), Redbud Farm (WV), Strawberry Creek Farm (VA), Cane Creek Valley Farm (NC), Gladheart Farms (NC), Thatchmore Farms (NC), Three Brothers Orchards (MI), Bridgman Farms (OH), Brickel Creek Organic Farm (OH), Northridge Organic Farm (OH), and Stratford Ecological Center (OH)

Co-Investigators:

Rutgers University - Dr. George C. Hamilton and Dr. Brett R. Blaauw

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USDA-NIFA OREI # 2012-51300-20097



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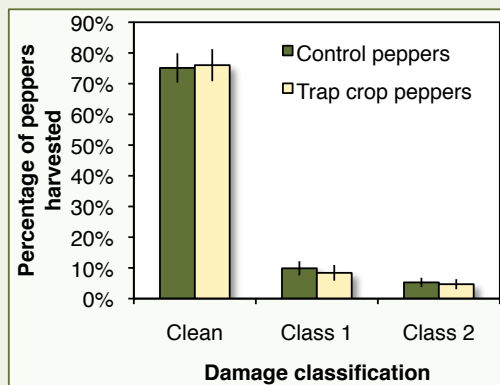
Whole-farm Management Strategies for Brown Marmorated Stink Bug

<http://eorganic.info/brown-marmorated-stink-bug-organic>

Results: Habitat Manipulation

A trap crop is the planting of an attractive host plant surrounding a cash crop with the goal of preventing or delaying injury of the cash crop. We evaluated a combination of sunflower and sorghum as a trap crop for BMSB.

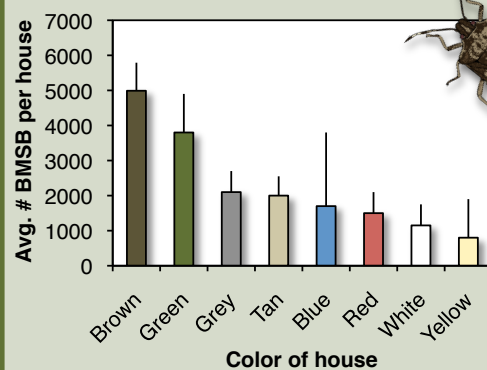
The trap crop was attractive to BMSB and native stink bugs and successfully delayed colonization of the pepper crop. Pepper injury was classified as "Class 1" if two or less feeding sites were visible externally, and "Class 2" for >2 feeding sites. There was no significant difference in the percent of clean (undamaged) peppers, as well as peppers considered "Class 1" or "Class 2" damage between the control and trap crop surrounded peppers.



Results: Dispersal Behavior

In field choice trials between 4 crops, BMSB nymphs moved from Swiss Chard to sweet corn and then to soybeans. Nymphs always moved to peppers but they were not as attractive as the other crops. At the farm-scale, movement begins within barns/sheds, then to wooded areas, and then to fruit hosts. Final movement prior to over-wintering was to corn and black locust.

Citizen scientists helped to identify characteristics of houses that act as overwintering sites for BMSB. Preliminary results suggest that brown homes and structures near agricultural and wooded habitats have the highest populations of overwintering BMSB. Similarly a brown trap on buildings caught high numbers of overwintering BMSB.



Results: Impact of Natural Enemies

Natural enemy populations and activity in various organic crops were evaluated to assess biological control activity across 8 states. Video surveillance and lab feeding trials have determined that "traditional" predators may not be the major players in BMSB biological control, but rather that katydids, spiders, grasshoppers, and earwigs may have the greatest impact on BMSB eggs.

Sentinel BMSB eggs are attacked by existing natural enemies, but currently predation and parasitism levels are low at ~6%. Supporting natural enemies through the provision of floral resources through "insectary strips" has the potential to enhance the biological control of BMSB.

