Brown Marmorated Stink Bug
Working Group Meeting

Fruit Research & Extension Center
Penn State University
290 University Drive
Biglerville, PA 17307

June 20-21, 2011

Submitted by:

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Submitted August 22, 2011
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## Brown Marmorated Stink Bug Working Group Participants

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<td>Catoctin Mountain Orchard 15036 North Franklinville Road Thurmont, MD 21788</td>
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Gariepay, Tara  
Agriculture and Agri-Food Canada

Gill, Stanton  
University of Maryland  
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Central MD Research &
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<td>Beneficial Insects Introduction Research Unit</td>
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<td>Office of Congressman Joe Pitts (PA)</td>
<td>Congressman Joseph R. Pitts (PA-16), 150 North Queen St., Suite 716</td>
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Lurvey, Edith  IR-4  
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Myers, Clayton  US EPA

Myers, Elizabeth  Northeast IPM Center

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Executive Summary

The brown marmorated stink bug (BMSB), *Halyomorpha halys* (Stål) continues to spread throughout the United States. Officially, BMSB has been detected in 33 states and the District of Columbia. Large populations are now established in PA, NJ, DE, MD, WV, and VA; each documented severe losses in crops and serious nuisance problems from BMSB in 2010. Established populations also exist in CA, CT, IN, KY, MA, NC, NH, NY, OH, OR, and TN, though crop losses have not yet been reported. In addition, BMSB has been detected in AL, AZ, FL, GA, IA, IL, MA, MI, MN, MS, NE, RI, SC, VT, WA, and WI.

The third formal BMSB Working Group meeting was held at the Fruit Research & Extension Center, Penn State University, Biglerville, PA on June 20-21, 2011. Research and extension personnel from USDA-ARS, Rutgers University, Penn State University, Cornell University, North Carolina State University, Oregon State University, University of Maryland, Virginia Tech, Ohio State University, Michigan State University as well as commercial research industry professionals, commercial and organic growers, USDA-APHIS and OPMP, EPA, EPA-IR-4, and Northeastern IPM Center attended the meeting. Participants delivered presentations discussing the impact of BMSB in Asia as well as research and Extension updates. Regulatory representatives discussed updates with regard to the potential release of classical biological control candidates and insecticide. Over 80 people were in attendance, and BMSB Working Group membership has doubled since the first meeting held in June 2010.

Members learned that BMSB has been officially detected in Ontario, Canada. During the early part of the growing season in 2011, severe injury was reported in stone fruit in parts of WV and MD as large populations moved in from natural overwintering sites in late May-early June. Damage in other crops had been minor to date, but increasing populations were detected in a number of locations via black light trapping. BMSB did not respond to traps baited with methyl (2E, 4E, 6Z)-decatrienoate early in the season. This same finding was reported in WV, MD, NJ, PA, and VA. Visual scouting was being used in a number of cropping systems. Many crops are being monitoring for BMSB activity and damage throughout the mid-Atlantic, Midwest, and West Coast (particularly in Oregon). In addition, season-long sampling of wild hosts is being conducted in VA and MD. Several hosts including white ash, mulberry, tree of heaven, *Paulownia*, and kudzu seem to have persistent populations. Conventional and organic growers relayed their concerns regarding the difficulty of managing BMSB on their farms and the increased costs and labor associated with increased insecticide applications. Members participated in a wine tasting to determine if they could detect the presence of BMSB in both red and white wines.

In addition to the serious agricultural threat posed by BMSB, homeowners and businesses continue to be plagued by this serious nuisance pest. One member described the process of removing over 26,000 stink bugs from his residence beginning on January 1, 2011. Both national and regional press continue to follow BMSB and report on this issue extensively.
### Research Priorities

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<td>Identification of true pheromone</td>
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<td>3</td>
<td>Studies of basic BMSB biology (physiology, generations)</td>
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<td>Biocontrol agents--identification and study of parasitoids, fungal pathogens, and predators (native and foreign)</td>
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<td>Host utilization, preference, and range</td>
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<td>Defining damage diagnostics and economics of injury</td>
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<td>Crop susceptibility and timing</td>
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<td>Development of IPM-friendly management tactics</td>
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<td>Standardize methods for insecticide trials and conduct screenings of existing materials</td>
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<td>Insecticide toxicity screening</td>
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<td>Impact of landscape and habitat on population</td>
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<td>Investigation of host-plant volatiles as attractants</td>
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<td>Identification of potential repellents</td>
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<td>Evaluation of parasitoid host specificity</td>
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<td>16</td>
<td>Examination of potential for trap-cropping</td>
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<td>Evaluate effects of BMSB management plans on beneficial agents, including pollinators</td>
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<td>Evaluate potential impacts of cultural control measures</td>
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<td>19</td>
<td>Assess secondary pest outbreaks related to chemical control of BMSB</td>
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<td>20</td>
<td>Mapping and assessment of distribution</td>
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<td>21</td>
<td>Evaluate landscape-level/watershed-scale population distribution</td>
<td>19.27</td>
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<td>22</td>
<td>Translation and synopsis of research to date from Asia</td>
<td>20.19</td>
<td>32</td>
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<td>23</td>
<td>Study potential for damage of harvested/value-added crops by contamination with BMSB</td>
<td>20.26</td>
<td>35</td>
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<td>24</td>
<td>Generate methods and baseline for evaluation of resistance development</td>
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<td>25</td>
<td>Determining monitoring strategies for urban areas</td>
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<td>26</td>
<td>Evaluate impact of orchard groundcover management</td>
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<td>27</td>
<td>Assessment of economic impact in urban environment</td>
<td>23.17</td>
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<td>28</td>
<td>Examination of cross-attractancy of BMSB and green stink bugs</td>
<td>24.39</td>
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<td>29</td>
<td>Evaluate potential impact of vertebrate predation</td>
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<td>30</td>
<td>Assessment of displacement of native stink bugs</td>
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### Extension Priorities

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<th>Rank</th>
<th>Extension Priority</th>
<th>Mean Score</th>
<th># Responders</th>
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<tr>
<td>1</td>
<td>Education programs to growers and the general public</td>
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<td>2</td>
<td>Coordinate efforts of state and regional extension programs</td>
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<td>3</td>
<td>Develop revised and unified management plans</td>
<td>6.28</td>
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<td>4</td>
<td>Educating professionals to pest ID and diagnosis of injury</td>
<td>7.08</td>
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<td>5</td>
<td>Evaluation of field application techniques for chemical control</td>
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<td>6</td>
<td>Develop economic injury thresholds</td>
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<td>7</td>
<td>Educational programming for structural and landscape industries</td>
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<td>8</td>
<td>Evaluate efficacy of insecticides/killing agents for homeowners</td>
<td>9.91</td>
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<td>9</td>
<td>Develop treatment recommendations and guidelines for urban environments</td>
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<tr>
<td>10</td>
<td>Initiate an eXtension community of practice (COP), potentially as a central website for information dissemination</td>
<td>10.25</td>
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<td>11</td>
<td>Evaluate materials for home-garden and home-landscape protection</td>
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<td>12</td>
<td>Education programs relevant to development of biological control projects</td>
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<td>13</td>
<td>Extension outreach and education programming for urban environment/homeowners</td>
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<td>14</td>
<td>Structure extension groups by commodity or region</td>
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<td>15</td>
<td>Initiate public awareness campaigns - posters, public service announcements, educational materials, etc.</td>
<td>11.58</td>
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<td>16</td>
<td>Raise awareness of importance of BMSB as pest - APHIS, local political channels, etc.</td>
<td>14.63</td>
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<tr>
<td>17</td>
<td>Direct homeowners to local politicians for complaints</td>
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### Regulatory Priorities

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<td>1</td>
<td>Expand use of existing registered products</td>
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<tr>
<td>2</td>
<td>Coordinate inter-agency and interdisciplinary funding</td>
<td>2.39</td>
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<tr>
<td>3</td>
<td>Product testing and labeling of new active ingredients/products</td>
<td>2.44</td>
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<tr>
<td>4</td>
<td>Define the economic and ecological threat</td>
<td>3.11</td>
<td>19</td>
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</table>
Insights From Asia

Brown Marmorated Stink Bugs in South Korea
Yong-Lak Park
West Virginia University
Division of Plant & Soil Sciences

Summary:
- South Korea is relevant for comparison to the Mid-Atlantic since it has similar latitude and seasons.
- South Korean agriculture involves intensive land use, intercropping, and greenhouses.
- BMSB overwinter under tree bark and are considered a forest pest of *Paulownia*.
- BMSB is the fifth most serious agricultural stink bug pest in South Korea.
- Mercury light trapping captured the most bugs in August (Lee et al. 2000) and traps baited with *P. stali* pheromone also captured bugs.
- Cultural controls for BMSB include avoiding intercropping and physically blocking the bugs.
- Field tests suggested the best pesticides to control BMSB were deltamethrin and fenthion.
- A significant compound in BMSB biology may be 4-oxo-E-2-hexenal.

Kusagikamemushi in Japan
Brent Short
USDA-ARS
Appalachian Fruit Research Station

Summary:
- Summary of research from Ken Funayama, a researcher of BMSB in Japan, and Japanese literature.
- BMSB in Japan is considered an “outbreak pest” in northern Japan.
- 1 generation of BMSB in Northern Japan; 2 generations in Southern Japan.
- Egg laying occurs after the photoperiod is 14L:10D and when temperatures are above 16C.
- BMSB are most active in fruit blocks at dusk.
- Treatment methods include pyrethroids and neonicotinoids and bagging fruit
- Rice straw bale traps are used to monitor overwintering populations.
- Spray programs in apple concentrate treatment in mid-May to July.
**Halyomorpha halys** in China

Aijun Zhang
USDA-ARS
Beltsville Agricultural Research Center

Summary:
- Fruit trees are major hosts of BMSB.
- BMSB can fly distances of up to 2 km.
- Management practices include bagging fruit, trap cropping in orchards with sunflowers or carrots, vibrating insect killing lamp (used for many types of bugs), squashing bugs and then spraying them as a repellent (not recommended for use inside houses because of smell).
- Natural enemies of BMSB that were most effective include *Trissolcus* spp. and *Telenomus* spp., especially *Trissolcus halyomorphae*.
- Pesticides used include dipterex or trichlorophon; attract and kill with a honey: water: pesticide mixture of 20:19:1 that was sprayed or brushed on.

**Research Updates**

**Vulnerability of Apple and Peach Fruit to BMSB: Temporal Effects**

Shimat Villanassery Joseph
Virginia Tech
Alson H. Smith AREC

Summary:
- Experiments underway include:
  - Determining effects of BMSB feeding injury on apple and peach during discrete intervals—fruits are exposed to BMSB for one month and caged for the rest of the growing season.
  - Postharvest effect of BMSB feeding injury on apple to characterize injury at harvest and post-harvest to determine necessary window of management

**Impact of BMSB in Greenhouse on Annuals and Herbaceous Perennials**

Stanton Gill
University of Maryland
UMD Cooperative Extension

Summary:
- Greenhouses have not reported incidents of BMSB or damage, but BMSB have been seen in headhouse areas.
- Traps put out in greenhouses in 2011 yielded no captures.
• A study was conducted caging BMSB on greenhouse plants, but damage was not considered significant.
• An experiment is ongoing with chickens as a form of BMSB control.

Early Season Incidence of BMSB in NJ Fruit Crops & Current Plans
Dean Polk
Rutgers University
Rutgers Cooperative Extension

Summary:
• 2011 studies include:
  o Assessing damage levels in peach, apple, blueberry and grape.
  o Comparing monitoring procedures (time count, beating tray, sweep sample, pyramid trap).
  o Late-season spatial identification of damage.
  o 2011 phenology.
  o Trap type evaluations (pyramid stock and altered and hanging stock and altered, with 2011 and 2010 pheromone).
  o Evaluating grower insecticide programs and comparing to an experimental program of Thionex, neonicotinoids, Lannate, and pyrethroids.

Update on BMSB Presence in NYS
Peter Jentsch
Cornell University
Hudson Valley Laboratory

Summary:
• BMSB were first detected in New York in 2008 as an urban pest and caused unknown economic injury from BMSB in commercial agriculture in 2010.
• A 2010 urban “survey” found BMSB specimens in 14 counties mostly in SE New York (where the ads ran).
• Monitoring 5 regions from 28 farms in several crops—pome and stone fruit, grapes, sweet corn, vegetables; using light traps and baited pyramid traps.
• Planning to make information available through the iMapInvasives website.
• A field residue study in apples found high levels of morbidity with Endigo and Lannate.

Commercial Tree Fruit Growers’ Perspective on BMSB Injury and Management
Guy Moore
Larriland Farms
Woodbine, MD

Summary:
- He grows apples, peaches, strawberries, blueberries, cherries, brambles, and vegetables.
- He is a grower cooperator with the USDA who has his farm scouted weekly.
- Spraying for BMSB every day this summer; in tree fruit using 6 day alternate row middle sprays using Thiodan as much as is allowed.
- Spray bill is 25% higher than normal.

Tom Haas
Cherry Hill Orchards
Lancaster, PA

Summary:
- He experienced heavy damage in the 2010 growing season, losing anywhere from 40 to 95% of a variety.
- Spraying for BMSB has disrupted a successful IPM program.
- The current situation is difficult because it is causing burnout and heavy financial loss on investment.
- New challenges to take into account include pre-harvest interval, re-entry interval, chemical requirements in pick-your-own blocks, and overall costs of control.
- The current system is not sustainable and chemical control is not a long term option for control.
- Strategies for control in 2011 include, monitoring movement from houses in early spring, weekly alternate row middle insecticide applications, scouting for eggs and nymphs, perimeter applications of Surround and insecticide, and treating trees after harvest if BMSB are present.

Bob Black
Catoctin Mountain Orchards
Thurmont, MD

Summary:
- He is spraying all the time, including borders with Orthene and has increased rates.
- More damage was found in Sentry and Pink Lady varieties.

Status of Ongoing projects in New Jersey
George Hamilton
Rutgers University
Department of Entomology

Summary:
• 80 blacklight traps are deployed throughout New Jersey, and maps are updated weekly. Blacklight traps are catching more than pheromone traps. Observations are also being made using visual inspection and beat sheets.
• Lab insecticide trials (following for five days) suggest dinotefuran has the highest efficacy, followed by cyfluthrin. Dinotefuran is also being tested in the field on apples and peaches.
• In the process of creating a BMSB rapid response multi-state project that has been requested by New England experiment station directors. Funds may be available from state experiment stations.

Intensity and Characteristics of a Home Invasion—A Case Study
Doug Inkley
National Wildlife Federation

Summary:
• From January 1 to May 31, he collected 26,052 BMSB from his house.
• When temperature was below average for that time of year, he found fewer bugs.

An Organic Grower’s Perspective on BMSB Injury and Management
Clarissa Mathews
Redbud Organic Farm
Inwood, WV

Summary:
• One of the major losses was to tomatoes, both heirloom and hybrid varieties. In addition, sweet peppers, okra, and sunflowers were attacked.
• Management strategies include Pyganic, an OMRI approved pyrethroid (which didn’t work, so it won’t be used in the future), row cover cages, successive cropping, and planting outside of susceptible periods.
• Concerned about drifting residue from neighboring farms as a result of increasing spray for BMSB, which could result in loss of organic license.

BMSB Update in Pennsylvania Fruit
Greg Krawczyk
Penn State University
Fruit Research & Extension Center

Summary:
• Performed a direct contact topical bioassay adding various pesticides directly to BMSB and observing lethality.
• BMSB is not a usual insect pest because it exploits many host plants, has basically unrestricted movement ability, has undefined monitoring issues, and has inconspicuous initial injury on fruit.
• Concentrating on strategies which include spray programs, Surround, Surround + insecticides, ground cover products, trap crops, and researching spatial and temporal distribution.
• Monitoring traps have captured bugs, however more BMSB have been seen on traps than in them.

Update on Insecticide Toxicity Bioassays from Virginia Tech
Tom Kuhar
Virginia Tech

Summary:
• Bioassays are being conducted with BMSB feeding on a bean that has been exposed to pesticide, and then observed at one, two, and three days thereafter.
• Bioassays with Rimon and Dimilin showed no effect on egg hatching, although mortality was observed with nymphs and adults.
• A field efficacy trial of insecticides is underway with peppers.
• The damage potential to cotton is probably not high, but it is beginning to be assessed.

Development of Organic Management Plans for BMSB
Matthew Grieshop
Michigan State University
Department of Entomology

Summary:
• A USDA OREI Planning Grant has been funded and will begin meeting first via conferences.
• The website bmsb.opm.edu gives BMSB distribution and regional contacts, experimental guidelines, control methods, and a forum.
• Immediate needs are for regional contacts for growers, field sampling of fruits and vegetables, suggestions for trap crops, potential collaborators, and work on biological control.

The Impact of Specific Management Programs on BMSB Injury in Commercial Orchards
Starker Wright
USDA-ARS
Appalachian Fruit Research Station
Summary:
- Ten orchards in MD and WV are being monitored with black pyramid traps, fruit injury sampling, and interviews with growers about spray programs.
- Trying to understand how grower selections of materials, spray rate, coverage, and concentration affect presence and severity of BMSB feeding injury.
- Challenges that are emerging for growers include, managing large, diversified farms, and concerns about residual effectiveness of insecticides, and label restrictions.
- At many orchards sampled, injury rate greatly increased around May 25.
- Current projects underway include analysis of residual insecticide effects, trap and stimulus improvements, olfactory deterrents, and trials with Surround in commercial orchards.

Evaluation of Insecticide-Based Management Options for BMSB in Virginia Apple and Peach Orchards
Chris Bergh
Virginia Tech
Alson H. Smith AREC

Summary:
- A current study is underway evaluating single-product insecticides on apples. Additional testing is being done on combination materials and Surround.
- Demonstration trials performed in commercial orchards are using aggressive spray programs based on results of lab bioassays.
- Traps are not capturing any BMSB.

Development of a Trap-Based Monitoring Tool: A Critically Needed Tool for the Grower Community
Tracy Leskey
USDA-ARS
Appalachian Fruit Research Station

Summary:
- Light bioassays are underway testing response of BMSB to different intensities of light.
- BMSB is not responding to the methyl decatrienoate lure early in the season, so additional sampling methods are necessary to understand movement of insects into orchards.
- Next steps are to continue with existing experiments, establish a foundation for light responses, and continue to identify semiochemicals that will obtain a better response from BMSB.
Blacklight Trapping of BMSB in NJ and Monitoring Network in Michigan
Anne Nielsen
Michigan State University
Department of Entomology

Summary:
• Blacklight traps have potential to detect new populations, detect spread, and could be used for management decisions, and early season monitoring.
• In previous years, a peak in captures occurred around May 31 and again in August. The May captures have been useful in predicting population size.
• When blacklight trapping is compared with conventional trapping, blacklight traps show a peak slightly before conventional traps.
• Research in Michigan includes early detection rapid response, comparison between blacklight and aggregation traps, damage and management in cherries, and characterizing flight behavior.

BMSB Solutions: How the IR-4 Project Can Help
Van Sterner
EPA-IR-4 Project

Summary:
• IR-4 facilitates registration of sustainable pest management technology for specialty crops and minor uses.
• Current activities include research on insecticide residues, newsletter articles, a Pest Problem without Solution study, and participation in working group meetings.
• IR-4 operates on the needs and requests of stakeholders.

Regulatory Updates

Plant Health Regulatory Perspective: BMSB
Alan Dowdy
USDA-APHIS-PPQ
Emergency and Domestic Programs

Summary:
• APHIS does not plan to change the regulatory status of BMSB.
• Farm Bill 10201 provided some funding for BMSB research.
• In dealing with a new pest, APHIS sets up a pest advisory group, identifies management options, seeks stakeholder input, facilitates a transition to management, and then reassesses the situation.
• APHIS also determines whether or not biocontrol agents can be released after data from host specificity testing research is gathered.
• Biocontrol for BMSB is still in the research stage.

Regulatory Issues: Pesticide Registration and Emergency Response
Clayton Myers
US EPA

Summary:
• Endosulfan is under a phase out agreement by 2015. Removing the pomace restriction is being considered.
• A decision on dinotefuran is expected soon and if approved would be able to be used in seven states.
• Registration pathways for pesticides include FIFRA Section 3 for a new active ingredient, extended uses, or amended registration, Section 18 pathway for emergencies, or 24c pathway when all tolerances remain the same but the label is extended under allowed limits.
• Bifenthrin is being discussed but cumulative and aggregate assessments must still be done.
• Since pyrethroids are dominated by residential uses, label changes for crops are unlikely.

Industry Updates
ISCA Technologies: Strategies to Monitor and Control the BMSB
Agenor Mafra-Neto
ISCA Technologies

Summary:
• ISCA synthesizes semiochemicals including methyl decatrienoate, pheromones, plant volatiles, and repellants.
• Trap designs being tested are dome pitfall trap and solar powered light.
• SPLAT is a specialized pheromone and lure application technology that can be mixed with dyes, semiochemicals, and insecticides. It is particularly useful for attract-and-kill.

An Update on DuPont’s Programs for BMSB Control
Don Ganske
DuPont

Summary:
- A 2ee label may be added to Vydate and Lannate for BMSB.
- Research is being done on integrated programs such as alternate row middle versus complete applications and rotation of insecticides.
- Dupont is funding university trials on tree fruit, vegetables, and row crops.

**AgBio Traps and Lures**  
*Jan Meneley  
AgBio*

**Summary:**
- Produces the black pyramid trap supplied to the USDA and universities as well as pheromone release bubbles.
- The efficacy of the trap is not well established.

**Syngenta Insecticides: BMSB Control Options**  
*Erin Hitchner  
Syngenta*

**Summary:**
- Control options for BMSB from Syngenta include Lorsban, Carzol, Actara, Voliam Xpress, Warrior II, Endigo, and Thionex.
- Additional labeling for BMSB may be underway.

**Strube’s Stink Bug Traps**  
*Andrew Strube*

**Summary:**
- His trap design utilizes cool fluorescent lights.
- Field experiments are being done at Cherry Hill Orchards.

**BMSB Label Updates for Danitol, Belay, and Venom Insecticides**  
*Gary Kirfman  
Valent, USA*

**Summary:**
- Danitol has supplemental labels for all crops.
- Belay only has market labels for potato and tobacco, but it has supplemental labels for many other crops affected by BMSB.
• Venom has supplemental labels covering BMSB on vegetables, grapes, and brassicas. Section 18 approval is possible in July.

A New Rescue Stink Bug Trap for Both Outdoor and Indoor Use
Quing-He Zhang
Sterling International, Inc.

Summary:
• Rescue has multiple pheromone lures for multiple stink bug species. Outdoor traps will be available in July and indoor traps will be available in September.
• Research suggests BMSB are responsive to blue light.

Surround Crop Protectant: overview and Insect Activity
Kurt Volkner
TKI NovaSource

Summary:
• Surround is not currently being promoted for BMSB.
• Surround can be used for behavioral deterrents including oviposition and feeding, induce paralysis or altered behavior, and camouflage the host.
• Lab trials suggest Surround may provide 50 to 80% reduction in feeding damage attributed to stink bugs. More trials specific to BMSB are underway.
• Whole sprays of Surround are recommended over border sprays.

Bayer CropScience Insecticides for BMSB Control
Matt Mahoney
Bayer CropScience

Summary:
• Bayer products include Leverage, which can be used once per season on pome fruit and Baythroid XL which can be used once per season on pome fruit and twice on stone fruit. Additional 2ee labels are available for some crops.

New Trap Designs for Insect Monitoring
Darek Czokajlo
Alpha Scents, Inc.
Summary:
- Markets a sticky glue that is easily made into traps.
- Traps can be made in different colors and may be useful as a monitoring tool.
- A nylon cloth with pesticide in it may also soon be available.

Etofenprox: A New Active Ingredient
Jeff O’Neill
Central Life Sciences

Summary:
- Etofenprox is currently marketed in consumer products and to exterminators.
- A supplemental label for in-home use on BMSB will probably be approved in July.
- Etofenprox is a different form of pyrethroids and is very safe.
- Registration for major crops is being pursued.

Two Novel Pesticides Demonstrate potential for management of BMSB
Tim Johnson
Marrone Bio Innovations

Summary:
- MBI 203, a new species of chromobacterium, kills insects when they ingest the bacteria in 2-7 days. Live microbes are not necessary.
- MBI 206 is a new bacterial species that kills a broad spectrum of insects including most Lepidoptera.
- Ongoing research is determining nymphal response, feeding behavior after exposure, and faster knockdown with combination materials.
- Both are potentially useful for organic growers and should be registered soon.
Informal Email Reports from Working Group Members

From: Galen Dively [mailto:galen@umd.edu]
Sent: Monday, July 25, 2011 4:45 PM

We captured over 400 per night over the past weekend at our Beltsville MD trap and also seeing significant movement into crops.

Galen

From: Joanne Whalen [mailto:jwhalen@udel.edu]
Sent: Monday, July 25, 2011 5:43 AM

Hi All -- We do not have any historical catches but on the Newark Research Farm where populations were high last week we also found close to 150 per night last week in the BLT.

Joanne

From: Galen Dively [mailto:galen@umd.edu]
Sent: Sunday, July 24, 2011 11:12 AM

Just to let you know that since the middle of last week, light trap sites at Keedysville in western MD, Beltsville and Upper Marlboro in southern MD, and Queenstown on the mid Eastern Shore have been capturing 100's of BMSB per night. This represents a 5 to 10 fold increase in activity compared to trap captures during the same time period in 2010 and has exceeded the peak captures recorded in mid August last year. For example, trap captures during July 20-21 (2 days) last week totaled 866 BMSB at Beltsville compared to around 20-30 per night at Beltsville during mid-late July in 2010. I'm assuming these are the summer generation adults.

galen

From: Michael J. Raupp [mailto:mraupp@umd.edu]
Sent: Friday, July 22, 2011 5:48 PM

Hi Doug, We collected many on white and green ash at our EAB study sites where they we feeding and laying eggs earlier this year. These guys get on many woody trees and shrubs.

Michael J. Raupp

From: Tallamy, Doug [dtallamy@udel.edu]
Sent: Friday, July 22, 2011 11:02 AM

Interesting. We haven't found any on white ash yet, which is surprising since we have surveyed many ashes.
Hello all -

To add to the native host plant discussion, at this time of year I always found large numbers of nymphs (particularly late instars) on Cranberry Viburnum and White Ash.

-Anne

On Thu, Jul 21, 2011 at 5:07 PM, Tallamy, Doug <dtallamy@udel.edu> wrote:

Yes, what I have been noting is where nymphs are developing. Adults seem to pop up all over the place, particularly where there is fruit. My alternate leaf dogwood berries are favorites.

From: Kuhar, Thomas [tkuhar@vt.edu]

Sent: Thursday, July 21, 2011 3:02 PM

Thanks for the information Joanne,
Doug. My postdoc, Kathy has very similar BMSB data from surveys conducted in southwestern Virginia since May. You might be interested to know that one of our BMSB search team members is your former student, Chris Philips. You trained him well. We have also noticed more BMSB overall on Asian invasive trees/plants than others. However over the past week, the bugs appear to moving to whatever plant, fruit, or fruiting vegetable is available. It's hot, they're hungry and at the buffet now.

TK

From: Joanne Whalen [mailto:jwhalen@udel.edu]
Sent: Thursday, July 21, 2011 1:54 PM

Hi All -- Wanted to update you on a few things that we are finding in DE regarding BMSB:

(a) Native and Non- Native Plant Survey - I know that many of you know Doug Tallamy -- our Entomology department chair at the University of Delaware as well as his research interest on the Impact of Alien
plants on native ecosystems. He has a number of native and non-native plants established on our research farm in Newark, DE and my summer folks have been able to take some time looking at about 51 plants for the past 4 weeks to see what we find in terms of numbers as well as life stages in a 3 minute count per plant. I have attached the excel spreadsheet for all to see.

In speaking with Doug earlier this week, he also wanted me to update all on what he is finding in his off campus survey sites -- you can correct me Doug but I think you are doing 8 transects per site and doing 50 stops along each transect and recording plants encountered (native and non-native) and doing a 5 minute count of BMSB at each site. Basically -- most all of the nymphs he is finding are on non-native plants -- bush honey suckle, Paulownia, Autumn Olive and Porcelain Berry.

(b) Field Corn Surveys -- This year we are looking at 20-25 fields per week for stinkbugs (all species) in field corn. Just 2 days ago we found our first heavy infestation of BMSB adults and nymphs in one field corn location (200/100 plants on field edge by woods and 3/100 plants in the field interior) in New Castle County. In 2 other field we found low levels last week (2-3 per 100 plants on the perimeters). We are also seeing an increase in field corn on our Newark Research farm where we had high BMSB levels in 2010. It should also be noted that last week we saw an increase in native brown stinkbugs in some fields on the shore (MD and DE) -- assuming they moved from wheat stubble --

(c) Soybean Surveys -- Last week we started picking up BMSB adults in a few soybean fields in New Castle County, DE -- none in Kent and Sussex. We are currently surveying about 50-60 field on a weekly basis. Still waiting for the numbers from this week on soybeans but last week the numbers were low.

Thanks,
Joanne

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From: Paula M. Shrewsbury [mailto:pshrewsb@umd.edu]
Sent: Tuesday, July 19, 2011 9:57 AM

Hi BMSB people,

We found a newly molted adult BMSB on wild cherry / blackcherry (Prunusserotina) in Edgewater, MD on Sunday July 17th.

Please add two new grad students who will be working on BMSB to this email list:
Erik Bergmann: ebergman@umd.edu
Ashley Jones: ashleyj@umd.edu
Thanks,
Paula

From: Leskey, Tracy [Tracy.Leskey@ARS.USDA.GOV]
Sent: Wednesday, July 13, 2011 9:05 AM

Hello all,

In general, apples in our area have reached a stage of maturity where depressions and corking injury from BMSB feeding is beginning to develop. Prior to this, we detected only punctures and feeding sheaths beneath. We have some commercial apple orchards that have been experiencing high pressure, but the damage has not been economic -- to this point.

I have heard from a number of people regarding problems on squash and cucumbers.

Also, we continue to see large numbers of adults, nymphs and eggs on Ailanthus throughout the area.

More soon,
Tracy

On 7/4/11 6:05 PM, "Galen Dively" <galen@umd.edu> wrote:
Hi all,

I have prepared the attached draft of sampling protocols for several crop systems for your comments and suggestions as an initial step towards standardizing methods. I am sure you have sampling plans already in action, and can add or revise what I have suggested, particularly methods of sampling small and large fruit crops. As part of the NE Pepper Project and the soon-to-be SCRI project which includes host plant susceptibility studies for row crops, we need quantitative sampling methods that allow us to express BMSB densities in terms of numbers per unit of crop area.

Galen

On 6/26/2011 9:27 AM, Leskey, Tracy wrote:
Update - We have third instars in our voltinism field cage studies
here at the lab.

We also have begun to see BMSB corking injury appearing on some apple cultivars in the field. It is, of course, cultivar dependent as to when they will begin to show injury, but apples are now generally susceptible to more severe injury by BMSB in our area.

Finally, females collected from a wheat field in central MD have been laying tremendous numbers of eggs.

Best,
Tracy

>> From: Leskey, Tracy  
>> Sent: Saturday, June 25, 2011 6:51 AM

Good morning,
One other piece of information we can offer is based on our field cage voltinism studies. As of late last week prior to the WG meeting, we had 2nd instars present. And we have been observing 2nds and thirds in the field. Jeff Aldrich told me he had observed 4ths around Beltsville, but nothing beyond. So, my guess is no.

I agree with Tom. It could be either adults that hit the snooze button or adults moving from one host that is no longer acceptable to a host (peppers) that is.

Best,
Tracy

From: Kuhar, Thomas [mailto:tkuhar@vt.edu]  
Sent: Friday, June 24, 2011 11:20 PM

Galen,
I would guess that these are likely late risers of the overwintering bunch. They've been hitting the snooze button since May. Many folks in Virginia have complained that adults stuck around in houses much
later into the spring this year than past years.

We really did not find any BMSB egg masses until late May. So, I guess we could do the degree day calculations and see if it was possible to have completed a generation in less than a month.

TK

From: Galen Dively [galen@umd.edu]
Sent: Friday, June 24, 2011 6:22 PM

Hi all,

During the past three days, BMSB have started to invade veggies in our Beltsville MD plots. We observed feeding on young pepper fruits, mating adults and counts of five adults per eggplant, and a few in potatoes. Are these new adults or the overwintered ones? BL trap at Beltsville captured 146 during June 22 and 23 (2 day capture). We will initiate treatments in peppers and eggplant next week if numbers continue to increase and are consistent across the replicate blocks.

Galen

On 6/13/2011 6:03 PM, Leskey, Tracy wrote:
Hi all,

Some observations taken by Starker from a farm in MD that is located a few miles away from one of our cooperating tree fruit growers. Large numbers of BMSB adults and nymphs present in the peripheral zone of a wheat field. Starker averaged 8.75 bugs per sweep sample (25 sweeps) taken over 50 feet of just the heads. The bugs were actively feeding (Starker described them as gluttonous). The field had been planted in soybeans last fall and it appears that overwintered adults have been spilling into the perimeter of the field from adjacent hedgerows and wood lots. Also many adults present on wild hosts surrounding the field. Looking forward to seeing all of you next week.

Best,

Tracy
Hi Folks,
Two weeks ago, near Roanoke, VA, we found a BMSB egg mass on some early-planted sweet corn. Several adults were also detected in the tassels. I've also heard reports of adults feeding on peas and squash in Virginia. My postdoc, Kathy Kamminga has also logged a number of tree species with eggs and/or nymphs over the past two weeks. I'll ask her to bring a summary sheet of Spring 2011 Virginia BMSB observations to the Working Group Meeting in case anyone is interested.

TK

From: Galen Dively [mailto:galen@umd.edu]
Sent: Wednesday, June 08, 2011 12:47 PM

A few days ago, Terry Patton found BMSB feeding in the whorl of field corn along the border rows next to woodlots. No signs of nymphs or injury symptoms at this point but we will flag infested and infested plants and monitor their fate.

Galen

On 6/8/2011 12:13 PM, Doug Pfeiffer wrote:
Hello, all,
BMSB eggs are now hatching in vineyards. We made a vineyard trip yesterday, and my student Sanjay Basnet found this mass with first instars. We need to show growers which are which, because last week we had a grape cluster with a Podisus egg mass on the rachis. Eric Day made the photo with his photomicroscope.
Doug

From: kamminga@vt.edu [mailto:kamminga@vt.edu]
Sent: Friday, May 27, 2011 4:29 PM

Hi All,

Attached is a photo of BMSB mating in wheat. We found them in two
different wheat fields south of Roanoke. They weren't present throughout the entire field, but were discovered either alone or in a small group.

As Tom mentioned, I will be keeping a database of BMSB locations found throughout the year. Please send me information of any BMSB you see with the location, host plant and life stage.

Thanks,
Kathy

Quoting "Paula M. Shrewsbury"<pshrewsb@umd.edu>:

Hi Tom and Kathy,

Mike Raupp and I with the help of the other ornamental group members are keeping track of ornamental hosts and damage. Kathy and I will have to keep in touch.

Paula

From: Kuhar, Thomas [tkuhar@vt.edu]
Sent: Friday, May 27, 2011 12:07 PM

My postdoc, Kathy, spotted BMSB mating in wheat yesterday in central VA. She'll follow up with an e-mail picture. BTW, Kathy is trying to catalogue all of our spotting on plants this year.
So, please keep sending all of the BMSB occurrences lifestage, host plant, location data that you can.
Thanks,
Hi all,

Shimat reported seeing numerous BMSB feeding on ripening cherries in central VA this week. Orchards managers there indicated that this has been the case for a couple of weeks. This was in a U-pick block that has not been sprayed recently. We have not seen the influx of bugs into peach or apple orchards here at the Winchester research center that Tracy reported from some MD and WV orchards earlier this week. I've not had reports of similar issues in commercial orchards in this area.

- Chris

Hi Chris,

The nursery grower has peaches in his fields that have been planted yearly since 2007 (they are irrigated). All trees have fruit that are damaged by BMSB.

Paula
Paula,

You mentioned peaches being heavily infested; were those trees with fruit on them or young, non-bearing trees in a nursery?

Thanks - Chris

>>>>> From: Paula M. Shrewsbury [pshrewsb@umd.edu]
>>>>> Sent: Thursday, May 26, 2011 1:01 PM

Hi all,

Quick update on BMSB on ornamentals in MD...

We have traps out in nurseries, landscapes, and natural areas (possible overwintering sites). Traps (24 total) have been out for about 2 weeks. We have caught 3 adult BMSB as of last Friday.

In nurseries - we noted adults feeding and mating on redbud, but have not yet surveyed all hosts (that will be this week). One nursery grower also is growing peaches and apples and his peaches are heavily infested and damaged.

Yesterday we found adults, eggs and 1st instar nymphs on ash trees in residential landscapes in Prince Georges County, MD.

Good luck BMSBing!
Paula

From: Leskey, Tracy [Tracy.Leskey@ARS.USDA.GOV]
Sent: Wednesday, May 25, 2011 7:14 PM

Hello all,

I wanted to share a short summary of BMSB observations made today in commercial orchards.

This was also a threshold day in commercial peach orchard observations. We had two crews out today-one in Smithsburg, MD
and one in Berkeley/Jefferson County, WV. Within an hour of each other, both crews called in reporting large numbers of BMSB in managed peach trees. Not surprisingly, bugs were most dense in the peripheral zone of the plots bordering wild habitat, but not necessarily anywhere near structures. Estimates of bug density were in the vicinity of 3 bugs per tree in border rows, and feeding injury was very fresh but clearly evident.

It appears that the beginning of immigration and dispersal into commercial orchards has begun in earnest in both WV and MD.

More to come,
Tracy

From: Greg Krawczyk [mailto:gxk13@psu.edu]
Sent: Sunday, May 22, 2011 4:30 PM

In our 100 plus traps we have in nine orchards across PA since mid April, so far we found total of 26 BMSB, 10 brown SB, 2 dusky, 1 rough and 2 green SBs (plus some PCs). (Tom, thank you for the SB field guide, it is very helpful) Majority of BMSB were found in traps baited with the last year long release BMSB lure (Ag-Bio). Almost no catches in traps baited with the new HR lure.
In a separate trial we started to evaluate few different lures but none of them so far is catching anything (including last year lures). During our visual observation of trees last week (trees around traps but not traps) we found 14 BMSB, 1 brown, 2 dusky and 2 green SB actively feeding on apple foliage, not on fruit.
Plenty observations of BMSB feeding on cherries in a block with a very significant pressure coming from adjacent buildings but surprisingly no BMSB in the trap located on the edge of this block.
We also see small aggregations of BMSB on ornamental trees around houses.
We also found a single egg mass on apple tree but it is not BMSB egg mass, so we are rearing it in the lab for identification.

On May 18, 2011, at 5:28 PM, Bergh, Chris wrote:

Yesterday Shimat found our first BMSB (male) in the black, baited
pyramid traps in a commercial apple orchard. Nearly 70 traps have been in place in commercial apple and peach blocks and here on station since early to mid April.

Chris

From: George Hamilton [mailto:gchamilton01@gmail.com]
Sent: Wednesday, May 18, 2011 8:52 AM

We picked up our first bmsb in a blacklight trap at our cream ridge fruit station yesterday. It was a male

From: Leskey, Tracy
Sent: Tuesday, May 17, 2011 4:02 PM
Hi All,

Attached please find photos of BMSB feeding on 'Loring' peach.

Best,
Tracy

From: Galen Dively [mailto:galen@umd.edu]
Sent: Monday, May 16, 2011 5:44 PM

I also found my first BMSB adult on apples at Upper Marlboro last Friday and Cerruti has found more egg masses in wheat. However, only brown stink bugs have been present in small grains so far and at sub-economic levels.

galen

On 5/13/2011 10:03 AM, George Hamilton wrote:

We found our first BMSB yesterday at our cream Ridge station. Adults walking on black plastic in a strawberry block. George