

INTEGRATED PEST MANAGEMENT

insights

Fall 2014
Northeastern IPM Center



Pests on Green Roofs

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Pests on Green Roofs

ENERGY AND WATER SAVER

This 24,000 square foot green roof in Houston, Texas reduces energy consumption and minimizes effects on water resources. Source: Jacob White Construction Co.

The vertical height of a building doesn't pose much of a problem for pests. They find their way onto the roof just fine, no matter the size and height. Once there, it may be unclear who has the responsibility for managing them.

This warning comes from academic and industry experts who attended the National Conference on Urban Entomology in San Antonio, Texas in May of 2014. A session on pest management in the green roof environment was moderated by Allison Taisey, board certified entomologist and program coordinator at the Northeastern IPM Center.

A green roof, that "growing" trend in sustainable living, attracts both urban and agricultural pests. Managing them safely requires knowledge of both structural and agricultural pest management. Attendants at this session began working out some of the nuances. When faced with a green roof, a pest management professional (PMP) might find the pest problem out of the contract scope, license category, or pesticide label restrictions.

A green roof or living roof is a roof of a building that is partially or completely covered with vegetation and a growing medium, planted over a waterproofing membrane. It may also include additional layers such as a root barrier and drainage and irrigation systems.

Presenters at the sessions identified several research questions needing further study. What are the potential pests that might be new to the urban PMP? Which have potential to damage the membranes that protect the building from moisture in the soil? The starter list includes adelgids, grubs, crane flies, overwintering insects, and vegetable garden pests. Add these pests to the list that structural experts already know, including roof rats, mosquitoes, fire ants, termites, pigeons, and carpenter ants. They also identified a need for a pest identification guide for rooftop gardens and green roofs.

For now, PMPs should contact their local cooperative extension office for identification and insights on controlling agricultural pests. Visit <http://npic.orst.edu/mlr.html> to find your nearest office. The Northeastern IPM Center plans to add literature on green roof pest management to its resources database when it becomes available. Experts say urban and structural PMPs will need training on identifying agricultural pests, working safely around beehives, and applying materials on a green roof.

Another concern for pest managers: A structural applicator's license may not qualify a PMP for pesticide application on a green roof. PMPs must be clear about the scope of their abilities (legally-speaking) when promising to manage pests in and around structures with green roofs. Session presenters suggested a turf and ornamental license may be more appropriate for this setting. In the same vein, PMPs should contact pesticide manufacturers

to make sure a rooftop setting is a legal site for application. If a contract does include a green roof, PMPs must be able to access the roof for inspections—this can be difficult in the more self-sustaining extensive green roof systems.

Another topic that came to light in this session was water quality. Water runoff is a major component of green roof planning. How pesticides break down in the green roof media is an area that needs to be researched.

“Green roofs are now part of the building ecosystems that PMPs are trying to protect from pests,” Taisey said. “The green roof topic is full of opportunities for industry-extension partnerships that would help people manage pests on green roofs while posing the least risk to health, property, and the environment.”

Stink Bugs: Insights from Asia

A collection of articles originally published in China, Japan, and Korea and translated with American Farm Bill funds has yielded a bounty of insights into sustainable agriculture practices used in Asia against the brown marmorated stink bug (BMSB), a serious agricultural pest.



Stink Bugs: Insights from Asia

BROWN MARMORATED STINK BUG

The stink bug, *Halyomorpha halys* (Stål), is a voracious eater that damages fruit, vegetable, and ornamental crops in North America. The insect uses over 170 plants for food and reproduction, and threatens an estimated \$21 billion worth of crops in the United States alone. Researchers in the BMSB community, including those with the BMSB Working Group and the BMSB Specialty Crop Research Initiative (SCRI) Coordinated Agricultural Project, have tapped into the collection of articles. The BMSB Working Group is funded by the Northeastern IPM Center, which also directs outreach for the national BMSB SCRI research project.

One tactic against the pest used in Asia: cover each fruit on the tree with a paper bag. (American trade publications such as *Fruit Grower News* have discussed this approach.) According to USDA Agricultural Research Service (ARS) scientist Tracy Leskey, in Korea some fruit is grown to a huge size, perhaps three pounds, and the entire fruit is served as a dessert. Therefore, it makes economic sense to protect the fruit from BMSB and the fruit-piercing moth (“that huge moth is like a vampire because it flies at night and sucks out the juices out of ripe fruit,” Leskey commented.) Bagging represents a behavioral control that can be implemented and prevents insects from making contact with the growing fruit. Leskey mentioned it makes sense in smaller orchards where laborers can easily administer the bagging. The technique may be more challenging but still could be useful in larger settings.

In August of 2013 a team of researchers, including Leskey, led by Doo-Hyung Lee of USDA ARS, published a review paper on the biology, ecology, and management of BMSB in China, Japan, and Korea. The paper cites 100 articles, a significant selection of the 216 publications on BMSB known to exist from Asia.

According to the translation, one researcher from Japan wrote, “Stink bugs that migrate to apple orchards are often difficult to detect because they often hide in gaps between leaves and fruit in trees. Therefore, branches and the trunk need to be shaken just forcefully enough so that fruit does not fall from the tree in order to check for the presence of pests.”

Chinese researchers wrote about their experiments with light traps for monitoring and management. They mention tactics such as removing egg masses, capturing stink bugs physically, using a buffer zone plant around cash crops, bagging fruit, and creating an encouraging environment for parasitic wasps such as the *Trissolcus* species.

Other researchers, also from China, wrote that the stick-beating method causes bugs to drop, then pesticides can be applied on the ground under the tree. They believe that bagging fruit is not productive; they say it impedes growth of good quality fruit and does little to stop BMSB. They also mention that spraying equipment disturbs BMSB and causes them to fly away. The bugs return after spraying is done.

Scientists in Japan wrote that they trapped more bugs facing the river where cool breezes circulated than on the mountainside. They also said that spraying insecticide at entry points in dwellings helped stop stink bugs. Spraying DEET repellent at entry points also worked well.

A team of researchers in China wrote that saprophytic bacteria cause fruit flesh to turn light brown and the fruit falls easily from the tree. They believe bagging fruit reduces *H. halys* damage.

The male-produced aggregation pheromone (methyl (E,E,Z)-2,4,6-decatrienoate) of the brown-winged green bug, *Plautia stali* Scott is commonly used to attract *H. halys* to traps in the late season. Also: timing of insecticide applications was recommended early in the morning when bugs were less active.

“The translated Asian literature has taught us much about natural enemies and physical methods we can consider for managing BMSB,” Leskey said. “We’ve learned a lot about the bug’s biology and what types of crops it attacks. Not every tactic used in Asian systems will be effective in ours, but the research points us toward where we should be heading and away from tactics we can rule out.”

Chapter 3

Resources Fall 2014



Resources Fall 2014

BROWN MARMORATED STINK BUG

Best Stink Bug Trap

In 22 seconds, learn how to make the most effective indoor stink bug trap known to science, using a turkey pan, a desk lamp, water, and some dish detergent.

<http://vimeo.com/92354801>

Green & Healthy Property Management: A Guide for Multifamily Buildings

http://www.lisc.org/docs/publications/2013_green_healthy_prop_mgmt_guide.pdf

A guide to saving money on water and energy, improving building durability, reducing greenhouse gases and conserving water, and creating healthier environments for tenants and workers. Covers energy reduction, water conservation, green laundry, pest control, green cleaning, recycling, and other topics for a safe and healthy home.

EPA's revised bed bug page

<http://www2.epa.gov/bedbugs>

EPA's revised guide on getting out the bed bugs and keeping them out. Learn how to find bed bugs, get travel tips, use IPM to get rid of them, and take steps for “do-it-yourself” bed bug management.

Automation in Weed Control

In a recently published book, Steve Young, director of the Northeastern IPM Center, gathered 13 of the top engineers, biologists, and economists in the world to envision a time in the near future where robot-like devices perform mechanical weed control. The website of the publisher, Springer:

<http://neipmc.org/go/automation-springer>

The preface and three chapters that Young coauthored can be downloaded from DigitalCommons website:

<http://neipmc.org/go/automation-commons>

Funded Partnership Projects 2014

In 2014, the Northeastern IPM Center awarded \$300,000 for research and outreach through IPM Partnership Grants, a competitive program supported by funds from USDA's National Institute of Food and Agriculture.



Funded Partnership Projects 2014

BUTTON MUSHROOM

The projects include efforts to stop invasive insects, increase IPM knowledge among Latinos in urban and agricultural settings, and alleviate food deserts. The projects:

Bringing IPM to the Hispanic Workforce in the Mid-Atlantic Mushroom Industry, Ed Rajotte, The Pennsylvania State University, \$40,000.

Rajotte aims to increase IPM knowledge among Spanish-speaking members of the mushroom farm community.

Spotted Wing Drosophila (SWD) Working Group to Identify and Prioritize Research and Extension Needs, Greg Loeb, Cornell University, \$10,000.

The invasive SWD continues to be a serious threat to fruit crops in the Northeast. This working group will keep northeastern fruit growers informed about SWD risk and the latest management tactics.

Brown Marmorated Stink Bug (BMSB) IPM Working Group: Sustaining Coordinated Efforts and Multiplying Expertise, Tracy Leskey, USDA-ARS Appalachian Fruit Station, \$10,000.

The BMSB IPM Working Group will coordinate regional efforts against the invasive pest, conduct an identification clinic, and collaborate with companies to improve monitoring tools.

Regional Partnerships to Promote IPM in Urban Latino Communities, Lyn Garling, The Pennsylvania State University, \$40,000.

Garling will reach urban Latino communities in the Northeast with culturally-relevant education about preventing rats, mice, cockroaches, and bed bugs.

Training Diverse Urban Agriculture IPM Practitioners and Facilitating Connections to Underserved Markets, Jennifer Hashley, Tufts College, \$49,909.

The organizers of this project plan to help new growers, mostly immigrants, refugees, and beginning small-scale urban farmers, who want to expand production, improve crop quality, and grow sales of IPM-produced crops. They also will help growers bring their produce to low-income urban markets.

Translation and Promotion of a Cranberry Weed ID Guide, Hilary A. Sandler, University of Massachusetts, Amherst, \$18,504.

Sandler will translate and promote a weed identification guide, *Guide d'identification des mauvaises herbes de la canneberges*, originally published in Quebec, Canada. No comparable cranberry weed guide available in English covers the breadth of information found in this French guide.

Strawberry Pest Management Strategic Plan, Ann Hazelrigg, University of Vermont, \$20,000.

Hazelrigg will teach pest and disease identification and successful IPM strategies for small fruit and diversified vegetable farms. They will visit a small fruit propagation facility in Quebec, Canada and look at new and innovative growing systems that may be adapted for northeastern growers.

New England Fruit and Vegetable Scouting Network, Katie Campbell-Nelson, University of Massachusetts, \$49,487.

Campbell-Nelson will organize a scouting and pest advisory network tailored to the New England climate and seasons, providing growers with local and regional pest advisories.

Training Hispanics in Urban Agriculture and IPM to Address Food Deserts in Connecticut, German Cutz, University of Connecticut, \$45,000.

The Urban Agriculture and IPM training project will train Hispanic adults in IPM and organic food production and entrepreneurship. They'll supply fresh food locally to food deserts in Fairfield County, Connecticut, home to Bridgeport, Stamford, Norwalk, and Danbury.

Northern New England Pollinator Habitat Working Group, Amy Papineau, University of New Hampshire, \$17,100.

This working group will collaborate on methods to protect pollinator habitat in northern New England. They plan to protect existing habitat on farms, roadsides, and natural areas, and plant new flowers that are beneficial to pollinators.

Pest Management Information in Spanish

In the late 1970s Cesar Chavez became well-known for boycotting grapes in the United States, leading a movement concerned about agricultural workers' exposure to pesticides. Today, people who speak Spanish often make their own decisions about pesticides, whether in the home, in the field, or in schools and communities.



Pest Management Information in Spanish

GERMAN COCKROACH

The Northeastern IPM Center is publishing a growing collection of information about pests in both English and Spanish. Recent additions to the collection are a page dedicated to brown marmorated stink bug (BMSB) and database of IPM resources.

<http://www.northeastipm.org/ipm-in-action/espanol/> A database of information about integrated pest management, in Spanish. A collection of resources based in science. Information about pests, the health of children, pesticides, alternative solutions, and information sheets in Spanish about cockroaches and brown marmorated stink bug.

<http://www.stopbmsb.org/more-resources/espanol/> Brown marmorated stink bug, *Halyomorpha halys* (Stål), is a voracious pest of fruit, vegetables, and ornamental plants in North America. It was accidentally imported from Asia in the late 1990s. Despite being recognized in its native range as a pest, the damage it has caused in North America has been considerably worse.

Infórmate sobre el manejo sano de plagas

En los años setenta César Chávez logró un gran reconocimiento por organizar el boicoteo de uvas en los Estados Unidos. El fue líder de un movimiento enfocado en el manejo de los pesticidas y la salud de los agricultores. Hoy, los hispano-hablantes frecuentemente toman sus propias decisiones sobre el uso de

pesticidas en las casas, en el campo, o en las escuelas y las comunidades.

El Northeastern IPM Center publica una colección de información sobre las plagas en inglés y español. Adiciones recientes incluyen una página dedicada al chinche apestoso marrón marmolado (CAMM) y una base de datos sobre el manejo integrado de plagas (MIP).

<http://www.northeastipm.org/ipm-in-action/espanol/> Una base de datos sobre el manejo integrado de plagas. Una colección de recursos basados en ciencia. Información sobre las plagas y la salud de nuestros niños, pesticidas y soluciones alternativas, hojas informativas en español sobre las cucarachas y el chinche apestoso marrón marmolado.

<http://www.stopbmsb.org/more-resources/espanol/> El chinche apestoso marrón marmolado, *Halyomorpha halys* (Stål), es una plaga voraz que daña frutales, hortalizas, cultivos anuales y ornamentales en Norteamérica. Fue accidentalmente introducido al Norte del continente desde Asia a finales de 1990, y a pesar de que en su lugar de origen se reconoce como plaga, el daño causado en Norteamérica ha sido notablemente mayor.

Credits

Photo Credits

Cover: Pumpkins. <http://www.morguefile.com/archive/display/839785>

Green Roof: Jacob White Construction Co.

Brown Marmorated Stink Bug, Entire Insect: Susan Ellis, USDA APHIS PPQ, Bugwood.org.

Brown Marmorated Stink Bug, Close Up: Susan Ellis, USDA APHIS PPQ, Bugwood.org.

Button Mushroom: Stephen Ausmus, USDA Agricultural Research Service, Bugwood.org.

German Cockroach: Kansas Department of Agriculture Archive, Bugwood.org.

Northeastern IPM Center

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