Information for pest management professionals and pesticide applicators

UC IPM Green Bulletin

University of California
Agriculture and Natural Resources

Vol. 5 • No. 3 • December 2015

Stinky and Uninvited Winter Visitors

Brown Marmorated Stink Bug as a Structural Invader

Brown marmorated stink bug (BMSB), *Halyomorpha halys* (Figure 1), is an invasive pest native to East Asia (China, Japan, Korea, Taiwan) which was first sighted in the United States in 1996 in Allentown, PA, and reached California in 2006 (Pasadena and San Marino). It is currently established in several regions in California including Los Angeles, Santa Clara, Stanislaus, San Joaquin, Sacramento, Yolo, Sutter, Butte, and Siskiyou counties.

Since its introduction, BMSB has spread to 38 states on the East and West Coasts, where it has caused damage to fruits, vegetables, and ornamental plants. BMSB is also a significant nuisance pest for residents and businesses, since it may invade structures in large numbers for overwintering during the fall and winter. When disturbed or crushed, this bug produces a pungent odor (hence the name stink bug), unpleasant to many people.

In autumn, when temperatures begin to drop, BMSB adults seek shelter for overwintering and aggregate under dead tree bark, rocks, or in structures such as office buildings, houses, garages, and barns by entering through openings surrounding door frames and windows, vents, and other openings and cracks.

When individual bugs find a suitable place for overwintering, they release an aggregation pheromone that attracts other individuals; this is the reason behind their large numbers within structures and on plants (Figure 2).

Once inside, they enter narrow spaces within buildings and stay inactive most of the time. However, on warm winter days, they may become active again and might be seen on floors, walls, or flying around lights at night. Although BMSB does not damage structures or harm people, it is a nuisance, causing residents to seek control methods.

If BMSB adults find their way into a structure, the best ways to remove them are by sweeping, vacuuming, and hand-picking. However, these activities usually disturb the adults and trigger the release of their defensive odor, which can contaminate brooms and vacuum cleaner canisters or bags, as well as the floors and walls of the structure, making it difficult to remove them, especially when present in high numbers.

Brooms can be washed after use and vacuums can be customized by attaching a paint strainer (or nylon stocking) at the tip of the tube to prevent bugs from entering the vacuum cleaner bag or canister while vacuuming. Adult BMSB are attracted to light sources, especially to white light (also black or blue light) and fly toward them at

S. AUSMUS, USDA ARS

Figure 1. Brown Marmorated Stink Bug adult (top) and nymph (bottom).

B. VILLEGAS

Figure 2. BMSB adults aggregating under a tree branch.

...continued on Page 6

WHAT'S INSIDE...

Bed Bug Management Challenges

Survey of professional bed bug management in multi-unit housing

Bed bug management is especially challenging in multi-unit housing (MUH) situations such as public and low-income apartment buildings. In these environments, high resident turnover, lack of resources, ease of bed bug dispersal, and communication barriers may all contribute to chronic infestations.

Researchers and policymakers recognize the need to address this challenging situation and to design valuable and timely extension and applied research programs in order to assist pest management professionals (PMPs) engaged in this work. Data on bed bug incidence and management approaches in the western United States are lacking as compared to those in other regions. Through use of an online survey, the Western IPM Center's Bed Bug Work Group has recently assessed the current prevailing bed bug management practices in use, the most challenging aspects associated with bed bug management in MUHs, and the self-reported needs of the industry that may improve bed bug management outcomes in these environments. A total of 114 individual PMPs completed this survey, with over 76% of these responses coming from the western United States. Below is a summary of responses to the survey.

Attitudes, beliefs, and observations

Most respondents (73%) believed that bed bug infestations had increased in 2014 as compared to 2013 while some (22%) believed that the levels of infestation had not changed during this period. Nearly half (49%) of all respondents considered summer to be the season with the most calls for bed bug services, while another large proportion (44%) reported no differences between seasons. Most (57%) of the respondents in this survey did not believe they had encountered pesticide resistance in the field.

MUHs, the focus of this survey, were considered by most respondents to harbor the worst bed bug infestations, to be the most difficult locations in which to manage bed bugs, and to be the locations most often treated by their companies (Figure 1). Hotels / motels and shelters were also believed to harbor high density infestations. After MUHs, hotels / motels and single-family homes were also regarded as difficult locations in which to manage bed bugs as well as locations most often treated.

Considering MUH environments, respondents were asked to list what they considered to be the biggest customer-oriented challenges to providing bed bug management services. Common themes reported included 'lack of preparation', 'clutter', 'lack of client cooperation', 'reintroductions', 'lack of education', 'misinformation', 'high costs', and 'language barriers'.

Behaviors and practices within MUH environments

According to the survey, 46% of respondent companies do not offer regular monitoring services and will only know bed bugs are present after a tenant complaint or random detection by MUH staff. Visual inspection was reported as the most common monitoring method used; 98% of respondents reported employing this method 'most of the time'. Such inspections are quite time-consuming and labor intensive, but can be accurate at detecting some infestations. Small and / or new infestations, however, may often be missed using this method. Additional detection methods were 'sometimes' used (Figure 2), including

Locations

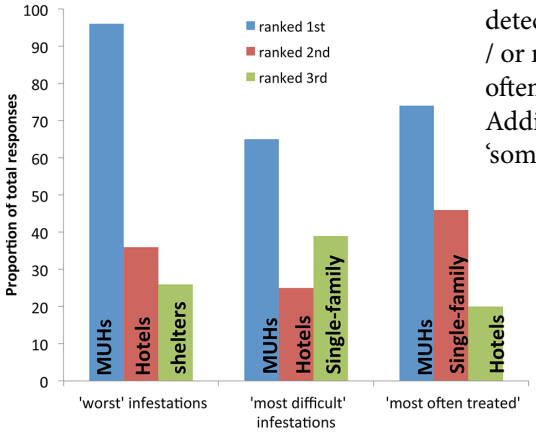


Figure 1. Locations reported to harbor the worst bed bug infestations, to be the most difficult in which to manage bed bugs, and to be the most often treated by respondents' companies.

Detection method

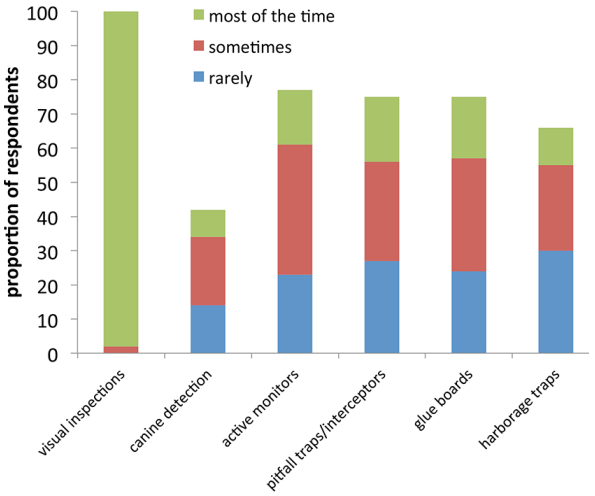


Figure 2. Bed bug detection methods reportedly used by respondents, with proportional frequencies of use.

...continued on Page 3

Bed Bug Survey

…continued from Page 2

active monitors (38% of respondents), glue boards (33%), pitfall traps / interceptors (29%), and harborage traps (25%). Canine detection, potentially the most accurate and efficient manner in which to detect small infestations in complex environments, was reportedly 'never' used by 58% of respondents, although 20% reported employing such services 'sometimes' and 8% claimed to use canines 'most of the time'.

Once bed bugs had been detected, or perhaps in reaction to complaints, insecticide applications were reported as the most common management tactics (Figure 3), with 94% of respondents reporting their use 'most of the time'. Other tactics used 'most of the time' included desiccants, mattress / box spring encasements, and vacuums. Several nonchemical management tactics; including spot freezing, heat chambers / containers, volumetric heat, steam, and exclusion services; seemed far less common, with the largest proportion of respondents reporting to 'never' use them. Of those respondents reporting the use of insecticides, 81% used liquid formulations, 71% used dusts, 62% used aerosols, 23% used fumigants, and 14% used impregnated resin strips. Figure 4 illustrates the most common active ingredients and formulations reportedly used by respondents.

Control method

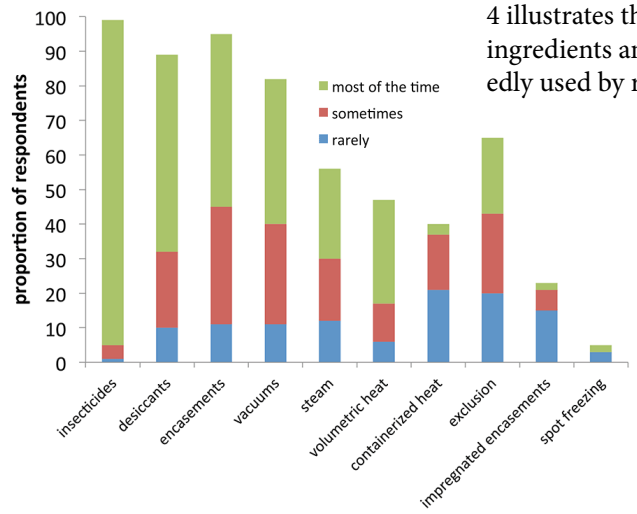


Figure 3. Bed bug control methods reportedly used by respondents, with proportional frequencies of use.

Insecticides used

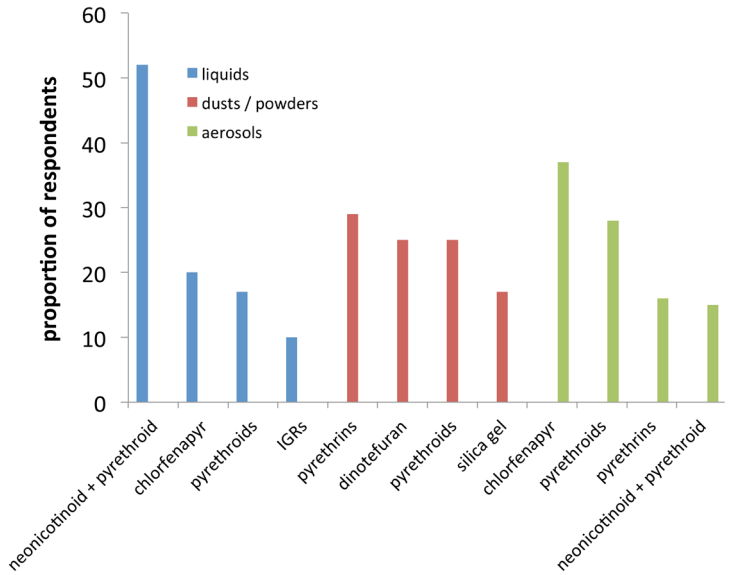


Figure 4. Common active ingredients within insecticides reported as used 'most often' by survey respondents, separated by formulation (liquid, dust / powder, aerosol).

D.-H. CHOE, UCR

Adults and nymphs of bed bugs, Cimex lectularius.

Education is an important component of an IPM program. Clients and employees need to be able to identify pests early in an infestation and to avoid behaviors and practices likely to lead to pest infestations; this is especially true when considering bed bugs in MUHs. Management and staff at MUHs were reportedly less likely than pest control company employees to have been educated in this way, and tenants at MUHs rarely received these educational programs. The educational component of bed bug IPM appears seems to be one in which the pest control industry may be able to improve.

In summary, PMPs reported substantial use of many different bed bug detection and control methods, though visual inspections and insecticide applications were clear mainstays. Regular monitoring programs and the use of several complementary control methods are primary components of urban IPM, advocated for strongly by members of our Work Group. We will consider these data as we work collaboratively with regional PMPs to design effective IPM programs for bed bugs in MUHs.

For more information

To read the entire summary of this research, please visit the online periodical Pest Control Technology at http://www.pctonline.com/article/pct0915-bed-bugs-multi-unit-housing.

—Andrew Sutherland, UC IPM Program and Western IPM Center Bed Bug Work Group
amsutherland@ucanr.edu

Western IPM Center

EPA Proposes New Rules for Pesticide Applicators

On August 5, 2015, EPA released a proposal to revise the standards for both commercial and private certified pesticide applicators. In California this rule would affect anyone with an applicator certification or license through the Department of Pesticide Regulation (DPR), the Department of Public Health (DPH), the Structural Pest Control Board (SPCB), or the County Agricultural Commissioner's office (CAC).

Affected licenses include:

- Qualified Applicator Certificate (DPR)
- Qualified Applicator License (DPR)
- Apprentice Pest Control Aircraft Pilot (DPR)
- Pest Control Aircraft Pilot (DPR)
- Operator (SPCB)
- Field Representative (SPCB)
- Certified Technician (DPH)
- Private Applicator Certificate (CAC)

The primary proposed changes that will likely affect California pesticide applicators the most are:

- **Category-specific Continuing Education (CE) requirements for commercial applicators.** Commercial applicators will have to earn 6 CE Units covering Laws and Regulations (called "core"), **AND** 6 CE Units for each category in which they are licensed or certified.

J. K. CLARK, UC IPM

(See section XIV.B. "Recertification Requirements Unit" in the Federal Register link below.)

- **Category-specific certification and CE for private applicators.** Private applicators performing soil fumigation or non-soil fumigation will be required to be certified in those categories; they will have to take an additional test, and there will be additional CE requirements. (See the Federal Register for section VII. Establish Application Method-Specific Categories..." and section XIV.B. "Recertification Requirements Unit".)

The public has the opportunity to comment on this proposal until **January 22, 2016** (extended from original date of Nov. 23, 2015).

The proposed revisions can be found on https://federalregister.gov/a/2015-19988. The Docket is titled: Certification of Pesticide Applicators Rule Revision (40 CFR 171). To comment on the proposed rule, visit http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OPP-2011-0183-0151.

—Lisa Blecker, Pesticide Safety Education Coordinator, UC IPM
lblecker@ucanr.edu

Pests in the Urban Landscape: http://ucanr.edu/blogs/UCIPMurbanpests

View or subscribe to our UC IPM Blog!

Our blog provides a one-stop site for UC IPM news related to pests of homes, gardens, landscapes, and structures. We post articles from our newsletters as well as announce new and revised Pest Notes and other new educational materials or activities of interest to urban and residential audiences.

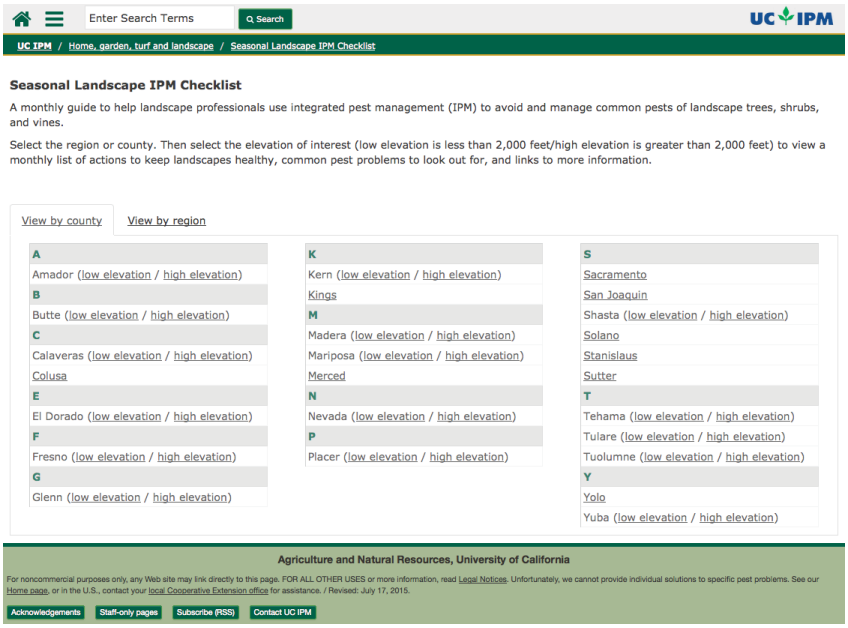
WHAT IS IPM? Integrated Pest Management (IPM) programs focus on long-term prevention of pests or their damage through a combination of techniques including resistant plant varieties, biological control, physical or mechanical control, and modification of gardening and home maintenance practices to reduce conditions favorable for pests. Pesticides are part of IPM programs but are used only when needed. Products are selected and applied in a manner that minimizes risks to human health, beneficial and nontarget organisms, and the environment.

NEW: Seasonal Landscape IPM Checklist

UC IPM has a new tool to help landscape professionals manage outdoor pests and problems from season to season: the Seasonal Landscape IPM Checklist (SLIC) http://ipm.ucanr.edu/landscapechecklist/.

This seasonal checklist guides users through the activities they need to prevent or manage pests throughout the year in their regions. Prevention is an important component of integrated pest management, and the checklist delivers prevention practices by providing an easy means to know what to do and when.

The checklist is linked to relevant information on specific landscape pests, diagnostic aids, and other helpful resources. Users can download a print-friendly version of their selected monthly checklist and will soon be able to subscribe to receive monthly e-mails about what pests and activities to consider in their regions. The checklist currently includes four regions in the state, and more regions will be added in the coming years.



Revised Pest Notes

Pest Notes are peer-reviewed scientific publications covering specific pests or pest management topics, directed at California's home and landscape audiences. Pest Notes are available online and in a downloadable PDF version.

Recently revised Pest Notes titles:

Hobo Spider (Nov. 2015)
http://www.ipm.ucanr.edu/PMG/PESTNOTES/pn7488.html

Opossum (Oct. 2015)
http://www.ipm.ucanr.edu/PMG/PESTNOTES/pn74123.html

Whiteflies (Sept. 2015)
http://www.ipm.ucanr.edu/PMG/PESTNOTES/pn7401.html

To access more than 165 other titles, visit UC IPM's Pest Notes Web page at http://www.ipm.ucanr.edu/PMG/PESTNOTES/index.html

Stink Bugs...

...continued from Page 1

night. An excellent way to trap and kill BMSB is to fill a large pan with soapy water and illuminate it with a desk lamp in a dark room at night. The bugs will be attracted to the light, fall into the water, and drown.

The long-term control solution to BMSB management is to prevent them from entering structures in the first place. BMSB has a high dispersal capability and consequently, properties can easily become invaded by BMSB from adjacent areas. Structures close to landscaped areas and especially weedy, neglected, or abandoned landscapes are more prone to BMSB infestations. For example, in one 2006 case in San Marino, CA, a garage adjacent to a neglected yard was invaded by so many BMSB adults that the homeowner could no longer park his car in the garage. Any time he did, the bugs would hide under the hood and when the car engine was started, adult bugs would produce their defensive odor, which entered the cabin through the vents.

To prevent BMSB from entering structures, exterior cracks need to be sealed using appropriate sealant materials such as caulk and sealant foams. Doors can be sealed using door sweeps and fitted thresholds. Gaps around window frames, pipes entering structures, and any opening on exterior walls and roofs should also be filled with an appropriate sealant material. For more on sealants, see the **Ask the Expert** section below.

Good weed and pest management practices in gardens and landscapes surrounding structures can reduce BMSB populations from building up and invading nearby structures.

Applications of repellent insecticides may prevent BMSB from entering structures in some cases, but their effect may last only for a short time. Therefore, efficacy of such applications depends on the timing of application. Improperly sealed structures may get re-invaded in subsequent seasons by BMSB, so the best long-term solution practice is to invest resources into structural exclusion.

For more information see the UC IPM Pest Notes: *Brown Marmorated Stink Bug* at www.ipm.ucanr.edu/PMG/PESTNOTES/pn74169.html.

—Siavash Taravati, Area Urban IPM Advisor, Los Angeles Basin,
staravati@ucanr.edu

Ask the Expert!

Q: What are some appropriate sealant materials to use for excluding pests from structures?

C. REYNOLDS, UC IPM

A: Appropriate and effective sealant materials for excluding pests may include mortar and cement products (for hardscape gaps), roof cement (for sealing chimney flashings), elastomeric sealants (for large gaps at joints subject to movement), expanding foams (for hard to seal gaps and for conduit ports), and caulks (for small gaps and joints where no movement is expected).

Read more about ways to exclude seasonal nuisance pests from structures in this article from the November 2014 issue of UC IPM's Green Bulletin: http://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=16145.

Q: Does UC IPM have online training I can take for Continuing Education Units?

A: UC IPM offers several free online courses for those seeking CEUs. See this blog post for a list of courses and other information. http://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=19481

University of California
Division of Agriculture and Natural Resources
Statewide IPM Program
2801 Second Street
Davis, CA 95618-7774

E-mail: ucipm@ucanr.edu
Online: www.ipm.ucanr.edu/greenbulletin
Editor: K. Windbiel-Rojas
Production: C. Laning

Produced by the University of California Statewide IPM Program with partial funding from the USDA NIFA EIP Program.