UC IPM
University of California
Agriculture and Natural Resources

Retail Nursery and Garden Center

IPM News

Vol. 2 • No. 4 • December 2012

Brown Widows Get Foothold in SoCal

During the last 10 years a new widow spider has moved into parts of Southern California. The brown widow spider, *Latrodectus geometricus*, is closely related to the well-known black widow spider, *L. hesperus*, (Figure 1) which occurs throughout much of California.

A recent survey of widow spiders in Southern California led by retired UC Riverside entomologist Richard Vetter revealed new information about the distribution of the new invader. Vetter's group found that, like the black widow, brown widows are outdoor spiders rarely found inside homes.

But they also found that brown widows tend to inhabit more exposed outdoor habitats such as under eaves or window ledges, under garden furniture with solid—not mesh—tops, or under the recessed handles of plastic trash bins. Black widows, in contrast, prefer more protected habitats such as in garages or sheds, under debris or woodpiles, or in a protected hole in an outer wall. Unlike black widows, brown widows weren't found in natural dry habitats or agricultural areas; they prefer urban environments and structures.

The researchers report anecdotal evidence that the brown widow spider may be displacing the black widow spider in some urban habitats. This is probably good news for residents because brown widow spider bites are infrequently reported compared to black widow bites and rarely cause severe symptoms in humans. In fact, despite their growing numbers, there is only one verified case

J. K. Clark, UC

Figure 1. Mature adult female black widow spider showing hourglass. The brown widow adult female has a fainter hourglass as well.

R. S. Vetter, UC

Figure 2. A mature adult female brown widow spider showing mottling.

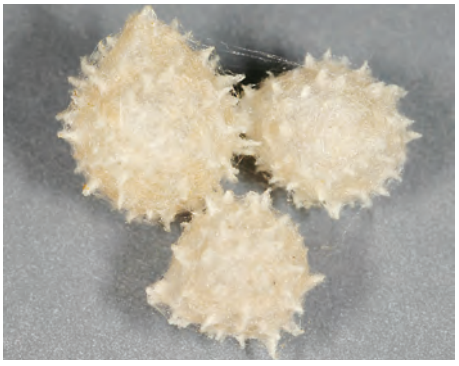
of a brown widow bite in Southern California, and reported symptoms were mild.

Brown widow spiders are mottled brown in all stages (Figure 2) and resemble immature black widow spiders (Figure 3), so some skill is required to distinguish the two species. The easiest way to identify an infestation of brown widows is to find its egg sacs, which have pointy protuberances (Figure 4) in contrast to the more round black widow egg sac (Figure 5). For more information about how to identify brown

... continued on Page 4

J. K. Clark, UC

Figure 3. Immature female black widow spider.



R. S. Vetter, UC

Figure 4. The distinctive egg sacs of brown widow spiders with pointy protuberances.

J. K. Clark, UC

Figure 5. Egg sacs of black widow spiders are smooth. Small, newly hatched spiderlings surround this egg sac.

WHAT'S INSIDE ...

WANT A FREE SUBSCRIPTION? To receive this newsletter electronically, send your e-mail address to UCIPMretail@ucdavis.edu with the subject line "Subscribe to retail newsletter." Please share this newsletter with your co-workers and encourage them to subscribe too!

What Are Those Bugs in the Alyssum?

A colorful new stink bug has been showing up in landscapes and farms in Southern California. It is *Bagrada hilaris*, also known as the Bagrada bug or painted bug, and is believed to be native to Africa. It feeds on plants in the mustard family (Brassicaceae), which includes cole crops, mustards, and radishes. In landscapes and gardens, a preferred host is sweet alyssum, also a member of the Brassicaceae, and Bagrada bugs have been devouring it.

The bug feeds on leaves, stems, flowers, and seeds causing stippling, wilting, and stunting. While the plants are green, feeding damage on the leaves and stems results in wilting and eventual scorching or bleaching of tissues (Figure 1). However, these insects prefer dried seeds to fresh foliage, since the nutrition obtained from seeds allows the Bagrada bug to reproduce.

The adult Bagrada bug superficially resembles another common stink bug, the harlequin bug, *Murgantia histronica*, as both have the typical stink bug shield shape and similar coloring. The Bagrada bug is much smaller however ($^3/_{16}$ of an inch vs. about $^1/_2$ inch long) and has different markings; the Bagrada bug is primarily black with orange and white markings (Figure 2), while the harlequin bug is primarily orange with black markings (Figure 3). The underside of the Bagrada bug can vary in color from almost black to nearly cream. Adults are typically found in tandem mating pairs, locked together end to end.

Eggs are laid in the soil or on leaves and are creamy white, turning orange as they age. Newly hatched nymphs are bright red with reddish-brown heads and thorax. Newly molted nymphs also appear bright red or orange (Figure 4). Nymphs gradually become darker with striking orange and white markings and develop wing pads as they progress through five instars. Multiple generations per year are possible depending on environmental temperatures.

J. Rodstein, UCR

Figure 1. Bagrada bug damage on this alyssum has resulted in stippling.

G. Arakelian, LA County

Figure 2. Adult bagrada bugs are black with orange and white markings. The female is larger than the male.

J. K. Clark, UC

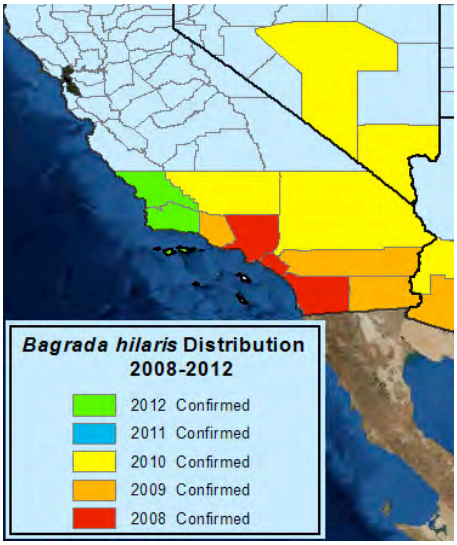
Figure 3. The harlequin bug is orange and black and larger than the Bagrada bug.

The Bagrada bug first was found in Los Angeles in June 2008, but it has rapidly spread to all the Southern California counties (Figure 5) and is expected to move northward in the state as temperatures and host food plants permit. It is also a pest in southern parts of Arizona, Nevada, and New Mexico, and its geographic distribution has increased dramatically within a very short time.

There is very little information on managing the Bagrada bug in landscapes. While its preferred host range is limited, it will feed on a variety of plants

T. Perring Lab, UCR

Figure 4. Early instar nymphs of Bagrada bug on dried sweet alyssum.



T. Perring Lab, UCR

Figure 5. Geographic distribution of* Bagrada hilaris *in California, by county, from 2008 to 2012.

to survive, including many grasses and legumes. Landscapers or home gardeners may choose to plant alternatives to alyssum that aren't in the Brassicaceae family, but this may not completely eliminate the threat.

Stink bugs are difficult to manage with insecticides, and repeat applications are often necessary. Research on managing the pests organically on cole crops suggests that pyrethrum may be effective against adults, while azadirachtin and insecticidal soaps may be most effective effective against nymphs.

For more information about the Bagrada bug, visit the UC Riverside Center for Invasive Species Research (CISR) Web site, http://cisr.ucr.edu/bagrada_bug.html.

—Darcy A. Reed, Entomology, UC Riverside, darcy.reed@ucr.edu, and Thomas M. Perring, Entomology, UC Riverside, thomas.perring@ucr.edu

Bed Bug Monitors

After decades of relative obscurity, bed bugs (Figure 1) are exhibiting a global resurgence. In the United States, the Northeast and Midwest regions have been considered bed bug hot spots, with the highest reported incidence, but California has recently experienced a multitude of bed bug reports, with San Francisco now considered one of the Top 10 most infested cities in the country. Causes for this resurgence may include increased global traffic and commerce, insecticide resistance, and a decrease in indoor residual pesticide applications.

Do-it-yourselfers are likely to seek guidance from store employees about how to manage bed bugs. However, because of this pest's complex life cycle, management is very difficult and almost always requires assistance from a specially trained pest management professional (PMP). Over-the-counter pesticide products are unlikely to be effective. Also, consumers may believe they have bed bugs when no infestation exists and may treat unnecessarily.

You can be most helpful by directing customers to bed bug monitoring devices on your shelves and by suggesting that customers contact a professional if these devices detect an infestation. Bed bug monitors aim to attract or intercept bed bugs during movement between dark hiding places (such as behind walls or in cracks and crevices) and places where hosts (such as people) rest. PMPs are already widely using these monitors.

Although quite diverse in terms of size, appearance, and price, monitors generally fall within one of two categories: active monitors or passive monitors. Active monitors employ an attractant—usually heat, carbon dioxide, host odors (kairomones), and/or pheromones—to lure bed bugs out of their harborage areas and into a pitfall or sticky trap within the monitor. These devices have the potential, especially in the absence of a host, to detect bed bugs that would normally remain hidden. Passive monitors may either exploit a bed bug's affinity for dark crevices (harborage traps) or simply rely on chance encounters with pitfall or sticky traps. Interceptor monitors are a hybrid between active and passive monitors in that they rely on the presence of a host (sleeping human) to attract hungry bugs and trap them en route to their meal.

Without efficacy data consumers won't know which products will best detect bed bugs. A team of UC researchers, led by UC Berkeley entomologist Vernard Lewis, recently conducted a series of bed bug monitor evaluations, considering active and passive devices available to consumers in stores or online. In these studies, known quantities of hungry adult bed bugs were released into an inescapable arena containing a monitor and several pieces of bedroom furniture and allowed to forage. After 24 hours, researchers recorded where each bed bug was within the arena.

For a monitor to be effective, it should be more attractive than the typical harborage locations (cracks and crevices within bedroom furniture). The five monitors evaluated (Figure 2) included two passive devices, BB Alert Passive and Bedbug Detection System (BDS); two active devices, BB Catch and NightWatch; and one interceptor device, Climbup Insect Interceptor. Since no hosts were available within these arenas, the Climbup device, a pitfall trap for use under legs of beds and other furniture, could be considered a passive device within this study. Three bed bug density levels (10, 50, or 100) were assessed within the 5.8 square meter arenas to determine whether monitor performance may change with differing population levels.

Although, statistically speaking, the tested monitors harbored no more bed bugs after 24 hours of foraging than did furniture within the arena, research did verify their value as detection devices since monitors are much easier to inspect than cracks and crevices in furniture. All tested monitors recovered at least 5% of the released bed bugs at all release densities.

A trend in the data suggests active monitors may be somewhat more reflective of bed bug density because they recovered a stable proportion of the released bugs regardless of the total number released, while passive monitors recovered a smaller proportion of the total as the total number released increased; however, the passive monitors still always captured bed bugs. Overall these data suggest passive monitors may be just as effective at detection as active monitors—at a fraction of the cost—and all monitors tested may be able to detect bed bugs at very low densities. These five monitors represent only a fraction of those available, and new devices, especially active monitors utilizing new technology, have come into the market since the culmination of this study.

D.–H. Choe, UCR

Figure 1. Bed bug adults (bottom and right, darker red) and nymphs. All life stages and both sexes preferentially feed on human blood.

R. Tabuchi, UCB

Figure 2. Five bed bug monitors were evaluated in a recent UC research trial—two active monitors, NightWatch and BB Catch (top row); two passive monitors, Bedbug Detection System (bottom left) and BB Alert (bottom right); and one interceptor-style monitor, Climbup Insect Interceptor (bottom center).

Bed bug management will continue to be difficult and is best left to experienced PMPs. However, bed bug detection devices, such as the monitors evaluated, may serve as valuable tools for consumers to confirm infestations before calling for help and may be alternatives to ineffective, unnecessary, and potentially dangerous do-it-yourself pesticide applications. For more about bed bug biology and management, see the Pest Note *Bed Bugs* at http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7454.html.

—Andrew Sutherland, UC Statewide IPM Program, San Francisco Bay Area, asutherl@ucanr.edu

IPM Consultants for Retail Stores

Are you seeing an increase in customer questions about the safety of the pest control products your store carries? If so, you aren't alone. Stores throughout California report a surge in interest in less toxic products and organic pesticides. At the same time, manufacturers are releasing an unprecedented number of these types of products.

With so many choices and the ever-changing selection of products, wouldn't it be nice to have someone to help educate your employees about the less toxic pesticides on your shelves? The good news is that this type of help has recently become available through the IPM Advocates program, which certified its first group of IPM consultants for retail stores in June.

The IPM Advocates program is a cooperative effort between the Bay Area Stormwater Management Agency Association (BASMAA) and the University of California IPM Program (UC IPM) funded through a grant from the California Department of Pesticide Regulation (DPR) Pest Management Alliance (PMA) program to promote IPM methods to consumers.

Ten individuals completed the year-long IPM Advocate certification program, which involved intensive training and mentoring from UC IPM and the Our Water, Our World (OWOW) program, which has been working with retail nurseries and garden centers for more than a decade to promote less toxic pest management solutions.

IPM Advocates are available to assist stores in Northern California with inventory selection, in-store displays, marketing, customer outreach, and employee training workshops. Since the program's start in June 2011, the Advocates have trained 318 nursery and garden center managers, owners, and employees in 30 stores and have helped more than 90% of these stores increase their displays of less toxic products (Figure 1).

Advocates work with retail stores through stormwater agency contracts or projects with the OWOW program. To see the list of certified IPM Advocates and the areas they serve or to read more about the program, visit http://www.ipmadvocates.com/. If your store is interested in hiring an IPM Advocate, contact Annie Joseph at annie.joseph@ipmadvocates.com.

A. Joseph

Figure 1. IPM Advocate Steven Griffin labels less-toxic products on shelves.

UC IPM will continue to provide support to the certified IPM Advocates with continuing education and a collaborative consultation network that links them to UC expertise. IPM Advocates also take advantage of UC research-based IPM educational materials, online training, an extensive Web site, and informational touch-screen computer kiosks for loan—all of which are also available to all retailers. To learn more about Integrated Pest Management and how to manage pests using environmentally friendly methods, visit the UC IPM Web site at http://ipm.ucdavis.edu/retail/.

Brown Widows

... continued from Page 1

widows, visit the UC Riverside Center for Invasive Species Research (CISR) Web site, http://cisr.ucr.edu/identifying_brown_widow_spiders.html.

Currently brown widow spiders are known to be common in Los Angeles, Orange, San Diego, Riverside and San Bernardino counties. They have also been reported in Ventura and Santa Barbara counties, and experts believe they may eventually move up the coast of California and also into the Central Valley.

For more information about widow spiders and their management, see the *Black Widow and Other Widow Spider* Pest Note at http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn74149.html and the CISR Web site mentioned above. Details of the survey are reported in *J. Med. Entomol.* 49(4):947–951.

University of California
Statewide IPM Program
One Shields Avenue
Davis, CA 95616-8621

Phone: (530) 752-8350

E-mail: UCIPMretail@ucdavis.edu

Online: www.ipm.ucdavis.edu/RETAIL

Editors: M. L. Flint and K. Windbiel-Rojas
Production: M. L. Fayard

Produced by the University of California Statewide IPM Program with partial funding from the USDA NIFA EIPM Coordination Program. To simplify information, trade names of products have been used. No endorsement of named products is intended, nor is criticism implied of similar products not mentioned.

For more information about managing pests, contact your University of California Cooperative Extension office listed under the county government pages of your phone book, or visit the UC IPM Web site at www.ipm.ucdavis.edu.

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.