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Which Came First, the Bed or the Bug? Bed Bugs 201

May 9, 2017

Which Came First, the Bed or the Bug? Bed Bugs 201, one of a series of school Integrated Pest Management (IPM) webinars hosted by EPA's Center of Expertise for School IPM, was presented on May 9, 2017. Included here is information on the presenters and responses to participants' questions.

On this page:

Speakers

- **Mike Merchant**, PhD, Texas A&M AgriLife, m-merchant@tamu.edu
- **Jeff White,** Bed Bug Central, jeff.white@bedbugcentral.com
- **Marcia Anderson**, PhD, U.S. EPA Center for IPM, anderson.marcia@epa.gov

Questions and Answers

The questions below were posed by webinar participants. The responses may have been refined for clarification or to include additional resources.

1. **Why have bed bugs made a comeback and will we ever get their numbers down to pre-resurgent levels?**
   (J. White) We don't know but there are a lot of theories including changing pesticides and increased international travel. Most experts are saying we will probably not get back to pre-resurgence levels.

   (M. Anderson) The resurgence of bed bugs can not only be attributed to immigration as hitchhikers on belongings of people traveling from infested locations, they have also become resistant to a number of pesticides. In addition, they are being transported on second-hand items, such as used mattresses, upholstered furniture, and bedding. I am not as skeptical about getting bed bugs back to pre-resurgence levels. New pesticides, including biopesticides, have great potential for significantly reducing bed bug populations when used according to best management practices.

2. **Do the bed bugs traps in the tests described utilize baits? Did you see better control with or without baits?**
   (M. Merchant) No. Pitfall traps do not require a bait, lure, or CO_2 to catch bed bugs. Because baits cost money, it is cheaper to put out un-baited traps. That said, there are attractants that can significantly increase the numbers of bed bugs caught in pitfall traps. In some situations (like a school or retail setting, where you do not want to use a pesticide because of very low numbers of bed bugs and where it is unlikely that there is a reproducing population), use of attractants and/or CO_2 may be a good option.

3. **Can Cedarcide *(a cedar oil product*) be used by housing authorities to combat bed bugs? Is cedar oil highly allergenic or sensitizing?**
   (M. Merchant) Cedarside is one of a number of "natural" products touted for bed bug control. Whether Cedarcide can be used by housing authorities is dependent on what the label says. If the label allows the product to be used in these environments, then it is fine. Cedar oil is not regulated by the EPA because it is a 24(b) product – a minimum risk pesticide exempted from regulation. Because EPA does not regulate or conduct testing on the product, the EPA cannot comment on its efficacy.

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(J. White) Yes. I have experience with Cedarcide. You need to be very careful with all-natural sprays because research has shown many of them to be ineffective for bed bug control. However, a few are effective. In one account, we had fair success with Cedarcide. But it is all about how much pesticide you get onto the bug. Often, bed bugs hide in very tight, tiny spaces that are inaccessible to most untrained people.

With cedar oils you also need to worry about staining furniture and the strong odor associated with some of the products. In schools, you need to be extremely careful with anything that has a strong odor since some children are very sensitive to odors and may get sick. I would be extremely cautious using any product that is not EPA registered, especially one with a strong odor, in a public setting.

4. **How effective are mattress covers/encasements?**
(M. Merchant) Overall, they are quite effective and an important part of bed bug control in any apartment or housing authority site. They provide some protection from bed bugs that may not have been completely eliminated from a mattress or box spring during treatment, and allow you to continue to use the bed safely. Encasements trap bed bugs inside, and provide fewer crevices for them to infest than a typical mattress or box spring. They are not necessarily cheap, but they are a less expensive option than throwing away bedding and having to replace. (BTW, throwing away an infested mattress and box spring is not a good way to control bed bugs. Because not all bed bugs live on the bed, when you get a new mattress or box spring, they are usually quickly re-infested.)

(J. White) We are big fans of encasements. They save time and money on treatments. An encasement is also a lot less expensive than purchasing a new mattress or box spring.

5. **What does "knocking down bed bugs to acceptable levels" mean?**
(J. White) Bed bugs are more likely to be taken from one environment to another when infestations are really bad, as opposed to coming from a location with only a few bed bugs. If I have 10 bed bugs in my house, it is a lot less likely that I will take them to work with me than if I had 10,000 bed bugs in my house. Typically, when a student or staff member brings bed bugs into a school, it suggests that there is probably a bad problem at their house. If the family treats and knocks down the population to 10-50 bed bugs, it will dramatically reduce the chance that bed bugs will be introduced from the home back to the school. The term "acceptable" is open to interpretation.

6. **If we can't predict where bed bugs are going, how can we take a targeted approach?**
(J. White) It is unrealistic for an entire school to be treated because one bed bug was found in one classroom. For example, if one bed bug is found in one corner of 10,000 sq. ft. office, you cannot treat the entire space every two weeks. You need a pest management professional to assess the situation and determine the best course of action.

(M. Merchant) I agree. It is much more practical to focus inspections, vacuuming, and possibly insecticide dusts or steam treatments to the immediate vicinity in which a bed bug was last observed, or the highest risk spots. I recommend a targeted approach like this in combination with a good monitoring program.

7. **How sticky are bed bug eggs and do they stick to clothing and get carried home?**
(M. Merchant) Bed bug eggs are typically stuck by the females to surfaces on which they are resting. Eggs are typically not something you will pick up on your clothing and take home. When an adult bed bug is found on a wall or sofa, there may be a need for a spot treatment at that site. Short-acting sprays or heat/freeze treatments applied to within 2 feet of where the bed bug was spotted can help ensure that any eggs or other bed bugs in the vicinity are treated.

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8. **Can I view this webinar in the future and get a copy of the slides?**
   A recording of the webinar will be available through EPA's School IPM website. A copy of the slides may be requested by email (school.ipm@epa.gov) or by calling 844-372-7476.

9. **How prevalent are bed bugs in libraries and how do they get there?**
   (J. White) Finding a bed bug in a library is about as likely as an introduction in a school. However, *infestations* in libraries, as well as schools, are very rare. Some pest control companies treat libraries for bed bugs in the northeastern U.S. The frequency of bed bugs finding their way into libraries is going to differ by library and setting. If you live in rural North Dakota, I would not expect to see many bed bugs in those libraries. However, if you live in New York City or Boston, bed bugs in libraries are more common. I have not dealt with bed bugs in a school library.

   (M. Anderson) Bed bug sightings in libraries may happen because people check out books, read them in bed, and sleep with them on or near the bed. The bed bug finds a cozy place to hide within the pages or binding. Then the book containing the bed bug is returned to the library.

10. **Can bed bugs be brought into homes on shoes?**
    (J. White) Yes, I have introduced bed bugs into my own home on my shoes. If only 1 or 2 bed bugs are found in a school, it is not likely that they will hitch a ride on your shoes across campus or to your home. The issue of bed bugs hitching a ride on shoes is more of a threat for pest management professionals that treat for bed bugs. We are often in homes with hundreds, if not thousands of bed bugs. That is why we wear Tyvek booties to prevent bed bugs from being caught in the nooks and crannies of your shoes. Rutgers University has shown that repellents containing DEET can repel bed bugs for short amounts of time. Home health care workers are also vulnerable to carrying bed bug out with them on their shoes.

    (M. Anderson) Health care and social service workers who regularly enter homes with bed bugs should carry an extra pair of shoes to change into upon leaving an infested residence. They should place the potentially infested shoes in a sealed plastic bag and, upon returning home, place the shoes in the drier on high heat for a 30 minutes.

11. **Should home health care workers take any other precautions to prevent the spread of bed bugs?**
    (M. Anderson) Leave outer jackets and non-essential items in your vehicle. Never place an item you need to bring into the home on a bed or upholstered furniture. Many caregivers carry a plastic bag to put on a table prior to setting down equipment. Avoid sitting on upholstered furniture or beds in a home that you know is infested. Instead, sit on a metal or wooden chair. Have a change of outer clothes handy, perhaps in your vehicle, and if you change, place the clothes you wore in the infested residence in a sealed plastic bag. When you get home, place the clothes directly in the washer then dry on high heat for 30 minutes.

12. **How should a school nurse respond to teachers' concerns about bed bugs coming to school? Should student belongings be managed in a specific way? How should you notify parents when a bed bug is found on their child?**
    (M. Anderson) The following fliers can help school nurses and others in the school community deal with bed bug problems:
    a. Bed Bugs in Schools: Guidance for School Nurses (U.S. EPA)
    b. Bed Bugs in Schools Guidance for Administrators, Teachers and Staff (U.S. EPA)
    c. Bed Bugs in Schools: Guidance for Parents (U.S. EPA)
    d. Bed Bug IPM Technical Resources for Educators (Purdue University)

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13. **Do you have a standard protocol for dealing with bedbugs in schools?**
(M. Anderson) Each school should adopt their own bed bug action plan that meets the needs of the local school community. The following plans provide good examples:
    a. Integrated Pest Management Plan for Bed Bugs - Monroe County (Indiana) Community School Corporation
    b. Understanding and Controlling Bed Bugs in a Public School - Newark (New Jersey) Public Schools

    For more information, see EPA's bed bug website.

    (M. Merchant) Texas A&M AgriLife Extension also provides a model bed bug protocol for Texas schools.

14. **What was the name of the new bed bug product mentioned and is it effective on all bed bugs life stages?**
(M. Anderson) *Beauveria bassiana* strain GHA was registered by EPA in 2017 to control and prevent bed bugs in buildings and structures. It is effective when contacted by crawling bed bug adults and larvae.

15. **Is ozone an effective bed bug treatment and how much ozone is needed?**
(J. White) We have worked with ozone in the past with limited/no success. Since then, the ozone generating equipment is purportedly improved and the industry marketing it claims it's more effective now. I've always been cautious of it and don't know many companies using it.

16. **Are there bed bug educational sessions for building tenants?**
The Stop Pests in Housing program run by the Northeastern IPM Center at Cornell University brings IPM, including bed bug education, to affordable housing across the country with funding from a U.S. Department of Housing and Urban Development and U.S. Department of Agriculture interagency agreement.

17. **Is a sugar and yeast bait as effective as dry ice in creating CO_2 to attract bedbugs?**
(J. White) Yes.

18. **Are residential steamers effective in treating for bed bugs?**
(J. White) Many steamers can work for bed bugs but their effectiveness varies. Look for a steamer with larger steam-head attachments that allow the steam to exit at a slow pace.

19. **Some students' families are aware that they have bed bugs in their homes but lack the means to treat the problem, including even a vacuum cleaner. Are there financial support programs for those lacking the resources to purchase a vacuum cleaner or mattress/box spring encasements?**
(J. White) Unfortunately, I'm not aware of any. BedBug Central conducts a charitable event around the holidays where we team up with pest control companies and give back to those in need in their communities. Because a small number of companies participate and it's only around the holidays, we are only able to give back to a few families.

20. **Is boric acid effective against bed bugs?**
(J. White) No. Boric acid has to be ingested to kill the insect. Because bed bugs do not have chewing mouthparts, they are unable to ingest the product.

    (M. Merchant) No. Boric acid is a stomach poison that is effective only against insects that can ingest the dust with chewing type mouthparts—either when eating or grooming. Bed bugs have sucking mouthparts, do not groom, and there are currently no baits that they will ingest. Desiccant dusts - diatomaceous earth and silica aerogel - on the other hand, do not have to be ingested and have proven to have benefit against bed bugs.

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21. **Are bed bugs mainly found on fabrics and are they also found on vinyl products like bean bags and vinyl chairs?**
    (J. White) Bed bugs can infest vinyl and leather products but tend to be more attracted to fabrics.

22. **Is expanded cardboard useful in monitoring for bed bugs in gaps?**
    (J. White) While I've never tried this technique, we do know that bed bugs often are found on cardboard and several bed bug monitors use cardboard to provide harborage.

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