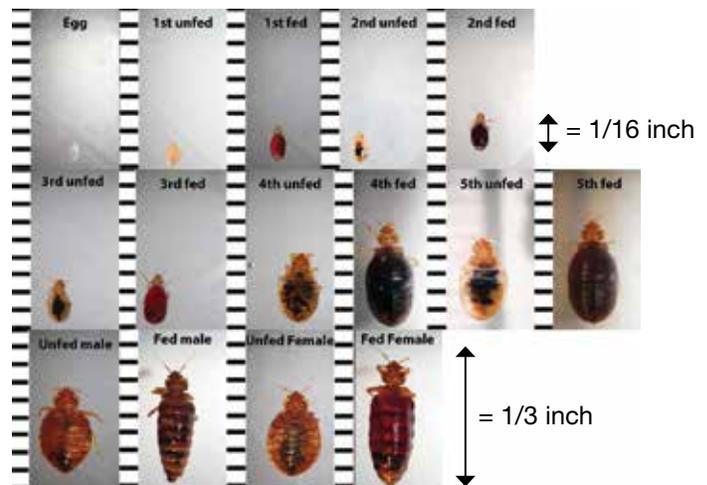


Affordable Bed Bug Management?

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A bed bug is a small insect that feeds on blood and is most active when humans are sleeping. They are beige to rusty red and may be 1/25 to a 1/3 of an inch depending on the life stage. Recently fed bed bugs are larger and redder than unfed ones. A bed bug bite may result in a red itchy welt that appears immediately or as long as two weeks later. Often no response to the bite occurs. Those over the age of 65 are less likely to react to a bite than younger people. While bed bugs and their bites may be irritating, they are not known to transmit disease-causing organisms.

Bed bugs are excellent hitchhikers and may enter homes via infested luggage, backpacks, purses, clothing, and furniture. If you live in an apartment building, bed bugs may enter around pipe, wire or duct penetrations and may even come under the front door. Once in, they can hide in cracks and crevices found in beds and other furniture, and walls or floors. Typical hiding places include seams and tufts of mattresses, inside the box spring, in and under nightstands (especially recessed screws) and clutter, behind wall baseboards and bed headboards, loose wall paper, and any other crack or crevice about the width of a credit card's edge.



Egg, fed and unfed immature, and male and female bed bugs. Rulers are in millimeters.

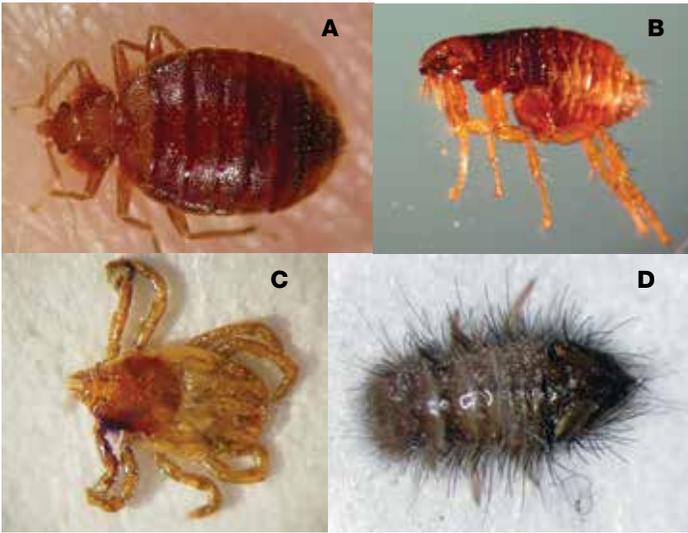
Because of the media attention surrounding bed bugs, residents often worry that bed bugs are present and assume any small crawling insect must be one. Many carpet beetle larvae are mistaken for bed bugs, as are ticks, fleas and other arthropods. One insect identification expert estimates that half of submitted suspected bed bugs specimens are something else.

Bed bug management is costly, and you should not attempt it unless bed bugs have been confirmed by a professional such as your local Extension agent (www.csrees.usda.gov/Extension) or specialist.

Once identification has been confirmed, contact a pest management professional (PMP) or company. A PMP has the tools needed for crack-and-crevice applications and access to a greater variety of insecticides and equipment. Bed bug populations throughout the nation have been found to be resistant to a class of insecticides known as pyrethroids. These are the active ingredients in many of the insecticides available to the general public for bed bug control.



Black fecal spotting, or bed bug poop, as well as shed skins left behind as the bug grows are indicators that bed bugs are or were present at some time.



Adult bed bug (A), cat flea (B), tick (C) and varied carpet beetle larva (D).

Most PMPs will have a separate contract for bed bugs that clearly explains their responsibilities and their client's responsibilities. The National Pest Management Association has released a list of best management practices (www.bedbugbmps.org) for bed bugs that both the resident and PMP will find helpful. If a building is used for the temporary or permanent lodging of others (TCA 62-21-124), pesticides must be applied by someone under the direct supervision of a person licensed by the Tennessee Department of Agriculture to apply pesticides. If you are a tenant, and your landlord is responsible for pest control, notify your landlord immediately if you think you have bed bugs. It is much easier to control an infestation if it is caught early.

One of the most thorough ways to manage bed bugs is to hire a professional to combine the application of pesticides into cracks and crevices along with a heat treatment and/or other nonchemical controls. Only trained professionals should apply heat treatment for bed bugs, since they have proper equipment to monitor temperatures and ensure the bed bugs are killed while preventing fire hazards.

Pest management professionals should provide you a list of things that must be completed for bed bug management to be successful. This list may include washing and drying bedding, reducing clutter, sealing pipe penetrations and other cracks and crevices, bagging clothing after it has been run through the dryer, placing bed bug detection devices under or near bed legs and against walls, etc.

If hiring a professional is unaffordable, here are options that will help suppress bed bug populations, but not necessarily eliminate them.

1. Use the "Hunt and Peck" technique.

Wearing gloves, use a flashlight and magnifying lens to see the bugs, and a plastic credit card, playing card, or similar long, thin item to move bed bugs out of cracks in beds, furniture, walls and floors into the open. Bugs can be crushed or stuck to tape and put in a sealable plastic bag to prevent them from escaping and reinfesting the home.

2. Vacuum.

Bed bugs can move fairly quickly, so a vacuum may be more efficient at catching bugs than using the "Hunt and Peck" technique. Place a knee-high stocking over the end of the vacuum tube and secure it with a rubber band prior to placing the attachment. **Attaching the knee-high is very important to prevent bed bugs from living in the hose or other parts of the vacuum and reinfesting the home.** Vacuum cracks and crevices including tufts, seams, zippers, and the trim of beds and upholstered furniture where bed bugs can hide. When you finish vacuuming, remove the knee-high, tie off and discard in a sealable plastic bag. If you don't have a knee-high, empty the contents of the vacuum canister into a sealable plastic bag and discard the bag in an outdoor garbage can. Check the vacuum for live bed bugs and remove them to prevent moving bugs to other areas of the house, then store the vacuum in a sealed plastic bag.



Use a knee-high stocking over the end of the vacuum tube to catch bed bugs and prevent them from infesting the vacuum.

3. Use steam.

All stages of bed bugs will die within a minute when exposed to temperatures higher than 120 F. Therefore, all stages of bed bugs will die when exposed to steam. Run the steamer over seams of the mattress, box spring, upholstered furniture, and other appropriate cracks and crevices. Steam should penetrate about 3/4 inch into fabric and more than 2 inches into a gap. Steve Kells (www.bedbugs.umn.edu) of the University of Minnesota provides many suggestions on using steam for bed bug control. A triangular-

shaped steamer attachment is more effective than other attachments. Do not use a narrow nozzle or pinpoint steam nozzle as the velocity of the steam may blow the bed bugs away from the surface before they are killed. Surfaces can be monitored with an infrared thermometer (one that can measure temperature without contacting a surface) and should reach 160-180 F after the steamer has passed. If the surface is too hot, move the wand faster, and if the temperature is too low, move the wand over the surface more slowly. Personal safety and fabric precautions are also discussed on the website mentioned above. Use steam before applying pesticides.

4. Wash and dry clothes.

Place clothes that can be similarly laundered into a clean plastic bag and tie the bag. Empty clothes into the washing machine. Place all empty plastic bags into a clean bag and tie off prior to disposing. Wash and dry on the highest allowable setting according to fabric type. Dry clean only clothes and dry clothing can be placed in the dryer on medium to high setting for 20 to 30 minutes to kill bed bugs. Do **not** place dry clean only fabrics into the washer. Fold clothes and place directly into a clean bag. Keep clothes in a tightly sealed bag until needed.

5. Use encasements made for bed bug management over mattresses and box springs.

These encasements are modified to keep the zipper from backing off the stop. They deny bed bugs from moving into mattresses and box springs and seal them in if they are already present. Using bed bug proof encasements without holes should prevent the bed bugs inside the encasement from biting the person sleeping on the bed. With no one to feed on, these bed bugs will eventually die, but may take many months to do so. Bed bugs are easier to see on the light-colored outside surface. **The encasements must be without holes to be effective**, so check them regularly for tears and ensure the zippers remain closed. See the manufacturer's directions to prevent tears. Repair tears with strong tape.

6. Use BlackOut BedBug Detector, ClimbUp Insect Interceptors and other monitoring devices.

Place BlackOut BedBug Detector (blackoutbbdetector.com/residential), ClimbUp Insect Interceptor (www.insect-interceptor.com) or similar devices under bed or furniture legs to help you find new infestations and protect against reinfestation. Pull beds away from walls, and don't allow bedding to touch the floor to prevent bed bugs from accessing the bed without climbing up the device. Lightly dust the ClimbUp's wells with talc and replace the bandage tape as needed. BlackOuts do not require talc.



Examples of bed bug monitoring devices (White ClimbUp [left], BlackOut BedBug Detector [center] and Black ClimbUp [right]).

If you have pets, prevent pet hair from accumulating in the trap so it does not form a bridge for the bed bugs to escape. These devices can also detect bed bugs when placed against walls in bathrooms, living rooms, bedrooms and closets. Monitoring devices can be made by applying a thin layer of oil in a plastic dish, soup can or empty cream cheese container, but these will make a mess if spilled. See Monitoring Devices (bedbugs.utk.edu/equipment.html) for other monitoring options.

7. Insecticides.

Many of the pesticides available to the general public are ineffective in controlling bed bugs due to their active ingredient and/or their method of application. "Bug bombs" or total release aerosols do not control bed bugs because the bug is often hiding in a protected spot and is not exposed to the insecticide. Diatomaceous earth (DE) may be effective when applied according to label directions, but DE is often misapplied. To kill bed bugs, DE should be lightly applied in the cracks and crevices where bed bugs are found. Unfortunately, untrained applicators often place diatomaceous earth in exposed surfaces that could potentially pose a hazard to people and pets.

To prevent future infestations ...

1. Be able to recognize bed bug eggs, nymphs and adults, as well as their feces and shed skin. See Bed Bugs in Tennessee at bedbugs.utk.edu for images.

2. When traveling:
Store luggage away from beds. Store luggage in the bathroom or place it in a sealable plastic bag.

Inspect the hotel room before you unpack. You'll need gloves, a flashlight and magnifying lens. Check behind the headboard, along the mattress seams, and other accessible cracks and crevices. Ask for another room if you find bed bugs.

Inspect luggage for bed bugs before leaving the hotel.

Upon your return home, wash and dry clothes immediately.

Leave luggage in a sealed bag until you have time to inspect and clean it or heat treat it.

3. When acquiring new, used or rented beds, bedding, furniture, appliances and other items that may harbor bed bugs, inspect them before purchasing or bringing them to your home. Put an end to “dumpster diving.” Don’t pick up furniture, bedding and appliances that have been placed next to a dumpster. Bed bugs may be one of the reasons these were placed there.

4. Inspect clothing, purses, backpacks and briefcases before entering the home. These items can be left in sealed plastic bags during the day to prevent bed bugs from hitching a ride home with you.

5. Mattress encasements made specifically for bed bug management can be placed over mattresses and box springs. The encasements deny bed bugs access to these items and the light color makes the bed bugs easier to see. The encasements must be intact to be effective, so check them regularly for tears and ensure the zippers remain closed.

6. Reduce bed bug hiding places by sealing cracks and crevices and reducing clutter, especially under the bed.

7. BlackOut BedBug Detectors, ClimbUp Insect Interceptors or similar devices can be placed under bed or furniture legs to aid detection of new infestations and protect against reinfestation. Pull beds away from walls and don’t allow bedding to touch the ground to prevent bed bugs from accessing the bed without climbing up the interceptor. Dust the ClimbUps’ wells with talc and replace the bandage tape as needed. Do not add talc to the BlackOut. Prevent pet hair from accumulating in the trap so it does not form a bridge for the bed bugs.

8. Inspect the bed when changing sheets to detect bed bugs when the populations are still low.

Sources:

Bed Bugs in Tennessee, bedbugs.utk.edu and Let’s Beat the Bed Bug, www.bedbugs.umn.edu

NY City Department of Health and Mental Hygiene, Stop Bed Bugs Safely, <http://www.nyc.gov/html/doh/downloads/pdf/vector/vector-faq1.pdf>

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Precautionary Statement

To protect people and the environment, pesticides should be used safely. This is everyone’s responsibility, especially the user. Read and follow label directions carefully before you buy, mix, apply, store or dispose of a pesticide. According to laws regulating pesticides, they must be used only as directed by the label.

Disclaimer

This publication contains pesticide recommendations that are subject to change at any time. The recommendations in this publication are provided only as a guide. It is always the pesticide applicator’s responsibility, by law, to read and follow all current label directions for the specific pesticide being used. The label always takes precedence over the recommendations found in this publication.

Use of trade or brand names in this publication is for clarity and information; it does not imply approval of the product to the exclusion of others that may be of similar, suitable composition, nor does it guarantee or warrant the standard of the product. The author(s), the University of Tennessee Institute of Agriculture and University of Tennessee Extension assume no liability resulting from the use of these recommendations.

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