

Bed Bugs

Management and Prevention

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Introduction

Bed bugs are considered the most difficult pest to control inside homes. These blood-sucking bugs hide in small cracks and crevices which make them difficult to find. Furthermore, they escape observation because of their ability to move rapidly and to feed quickly (two to 10 minutes) on an often sleeping host without inflicting pain. Tarsal claws allow them to grab onto human clothing and belongings easily and to be transported to other locations. Management is hindered due to resistance to a commonly used class of insecticides, pyrethroids. Bed bugs have now been reported in all 50 states, including many locations in Tennessee. But they have not always been so widespread.



Figure 1: Bed bug male (on top) and female adults with young nymphs (Credit: UT E&PP).

Some scientists theorize that, originally, bed bugs were associated with bats living in caves. When humans began using caves, these bugs started feeding on humans also. Closer associations with humans most likely occurred when people moved from caves to constructed homes. While the exact date when bed bugs starting living with and feeding predominantly on humans hasn't been determined, Greek writings as early as 423 B.C.E. indicate problems with bed bugs. Bed bugs arrived in North America with the earliest colonists and were more common in the U.S. prior to World War II. Populations declined soon after the widespread use of DDT and other synthetic insecticides began. Bed bug population numbers remained steady in parts of Europe, South and Central America, Africa and Asia. In the 1970s and 1980s, bed bugs were practically unheard of in the U.S., but their slow comeback started in the late 1990s.

The majority of bed bug infestations are found in apartments/condominiums, single-family homes and hotels/motels, as well as dormitories, shelters, health care facilities, office buildings, schools, movie theaters, retail stores and public transport. Any place people spend considerable time immobile can provide shelter for these insects. Bed bugs are easily transported and may be difficult to detect. It is wise for consumers to be able to recognize the different life stages of the bugs and to know how, what and where to inspect for bed bugs, especially when traveling.

Infestations do not cause disease and are not due to lack of cleanliness or socioeconomic status. However, bed bug infestations may cause psychological distress to those that are affected. Without professional help bed bug infestations may be very difficult to control. Pest management professionals (PMPs) offer various treatment options. Using a combination of methods often provides the best control. Consumers should be aware of what options are available and what to expect during treatment.

Reasons for Bed Bug Re-establishment in the United States

Some reasons suggested for the resurgence of these pests include the following, although some are more plausible than others:

- Banning of DDT (probably the least valid because some bed bug resistance to DDT was reported before it was banned).
- Travel (people returning from bed bug-infested areas such as Asia, Africa, Central/South America and Europe).
- Less spraying of residual insecticides indoors (cockroaches and ants have been controlled with baits rather than sprays).
- Pest management professionals missing infestations because they were unfamiliar with bed bugs.
- Less-than-effective treatments.

Identification

The adult bed bug, *Cimex lectularius* L., is 1/4-inch long, an 1/8-inch wide and reddish brown (Figure 1). It is flattened from top to bottom (Figure 2), with an oval body that is well adapted for hiding in narrow crevices. The body may become greatly enlarged and blood-red during a blood meal (Figure 3), but it subsequently turns a dirty brown. Bed bugs cannot fly or jump, but they are very mobile. Researchers timed one moving 16 centimeters in 4.17 seconds (7.6 ft/min.). Newly hatched nymphs are clear to lightly

colored with red eyes. Both nymphs and adults are covered with short, golden hairs. The male's abdominal tip is pointed, the female's rounded.

In Tennessee, one may encounter a relative of the bed bug called the bat bug or *Cimex adjunctus* Barber. Bats typically nest in caves but on occasion may roost in the dark spaces of an attic, where bat bugs may feed on the flightless young. When nursery or hibernating colonies disband or when a colony is discovered and excluded, bat bugs may seek humans as an alternate food source. Humans, bats and poultry can serve as hosts for bed bugs and bat bugs, but humans are the preferred host of bed bugs. These two species share certain characteristics: the beak (or sucking mouthpart) does not reach the base of the second leg, and the fourth antennal segment is shorter than the third. Distinguishing characteristics include the length of the fringe hairs on the pronotum, which are shorter than the width of the bed bug eye and longer than or equal to the width of the bat bug eye (Figure 4).

Biology

Bed bugs tend to aggregate in cracks and crevices and usually seek out a blood meal at night. Typically, they walk undetected across human skin, although when intentionally placed on a human, the observed movements may be more noticeable across hairier areas. Feeding generally occurs without the host's notice, but there may be a very slight twinge of pain that quickly dissipates upon initial insertion of the mouthparts. Because the human host is usually asleep when bed bugs are feeding, it is unusual for the host to be aware of them. The ensuing lump that develops or the tarry substances left behind (Figure 5) are often the first clues to the pest's presence.

Bed bug mating, called traumatic insemination, is an unusual process. The male "stabs" the female's abdomen with a specially modified organ and shoots sperm into the body cavity. The sperm then move to the female reproductive tract. In a suitable environment, the female will deposit elongate, white eggs about 1 mm long (Figure 6), which stick to surfaces.

Typically, a female will deposit up to five eggs a day and may lay as many as 113 eggs during her life. About six to 10 days later, a nymph will emerge from the egg. The nymph, after taking at least one blood meal between molts, will go through five immature



Figure 2: Bed bugs are vertically flattened, allowing them access to small cracks. Some say that a bed bug can fit into any crack wide enough to admit a sheet of paper.

stages called instars before becoming an adult. An adult female must mate and take at least one blood meal before producing eggs.

To go from egg through adult and egg again under ideal conditions (75 to 80 percent relative humidity, 83 to 90 degrees F) may take four to six weeks. Under less optimal conditions such as lower temperature and/or with fewer blood meals, development time may be longer. Adults can live several months (some say for more than a year) and nymphs for three months without feeding. Under typical conditions with a host (food supply), a bed bug may live more than 300 days.

Bites and Fears

When bed bugs are growing, they may feed as often as once a day with meals lasting from a few to a dozen minutes or longer. Bed bugs insert their mouthparts into the skin and search for a blood vessel from which to withdraw blood. When a person is bitten, a large oval lump or wheal may arise followed by itching and more inflammation. Or no reaction or a delayed reaction may be experienced. The bite may be mistaken for a mosquito bite or even a flea bite. Flea bites usually occur around the ankles, but bed

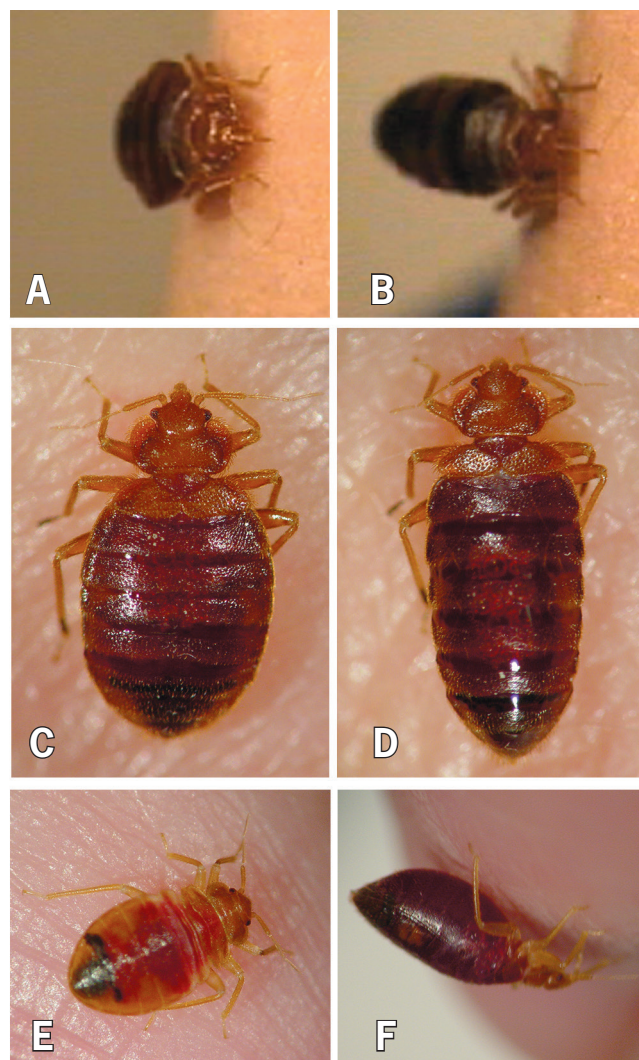


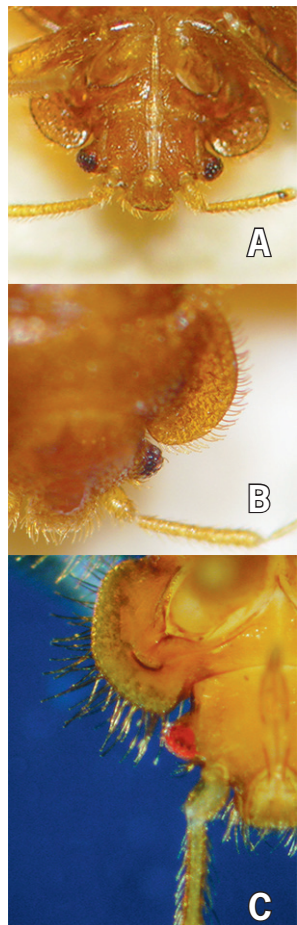
Figure 3. Bed bug adults get plumper (A then B) and longer (C then D) after feeding. This is more obvious in the nymphs (E and F). (Credit: UT E&PP)

bug bites are found on areas of the skin that are exposed during sleep, such as arms, legs, face, neck and shoulders. Because the bite reaction is similar to that caused by other insects, bed bug infestations are difficult to diagnose correctly when bites are first experienced. This allows the bed bug population to increase and possibly disperse before the culprit is identified. It is very difficult to identify a bug by its bite, so it is important to bring the bug when seeking diagnostic services. Bed bug bites may cause complications. Asthmatic symptoms have been reported as a result of a bed bug bite. It is estimated that 30,000 to 40,000 bed bug bites would be needed to result in an 8 ounce loss of blood. This population range is unlikely to occur in a bedroom. Stress, anxiety, sleeplessness or other psychological distress may occur for individuals experiencing a bed bug infestation.

Can Bed Bugs Transmit Disease Organisms to Humans?

At least 27 human disease organisms have been isolated from bed bugs, but biological transmission of a disease organism to a human has never been documented. Thus, they are not considered a serious health threat. Itching caused by bites is one of the major medical concerns. As with other bites or wounds in the skin, antibiotic or antiseptic applications are usually prescribed to prevent infection.

Where Did My Bed Bugs Come From?



Bed bugs are often accidentally transported in luggage, clothing, beds, furniture and other items. Because of their thin shape, their ability to stay hidden in tight spots and their quickness, bed bugs often move into suitcases, boxes and other containers without being seen. They are also transported into new living spaces when infested, previously owned mattresses, box springs or furniture items are bought or rented. Introduction of bed bugs is more likely in hotels, motels and apartments because of the frequent occupant turnover.

Because initial symptoms of

Figure 4. Bed bugs and bat bugs both have a beak that does not reach the base of the second pair of legs (A) and the fourth antennal segment is shorter than the third. Bat bugs and bed bugs can be distinguished by the length of the fringe hairs on the pronotum, which are shorter than the width of the bed bug eye (B) and longer than or equal to the width of the bat bug eye (C). (Credit: UT E&PP K. Vail (A&B), E. Bernard (C))

bed bugs are ignored or other causes are blamed, the bed bugs may disperse away from the bedroom before they are detected. Reducing and eliminating clutter in a structure lessens potential hiding places for any pest so it is prudent to plan for periodic reduction of clutter. At least remove items stored under beds. Bed bugs feed on warm-blooded animals (humans, bats, poultry, pigeons), so poor sanitation (i.e., leaving food around and not cleaning spills) will not directly affect bed bug populations. But because bed bugs hide in cracks and crevices, even very clean dwellings can have bed bugs.

Other animals can introduce bed bugs or their relatives to a structure. Check attics and other locations for alternate hosts, such as bats and birds. An entomologist should be able to distinguish bed bugs from their relatives. University of Tennessee Extension has a Soil, Plant and Pest Center in Nashville and entomologists in Nashville, Knoxville and Jackson who can assist your county Extension agent (extension.tennessee.edu/Pages/Office-Locations.aspx) in providing you with an accurate identification of a suspected bed bug.



Figure 5. The tarry residue deposited after feeding is often a clue that bed bugs are present. (Credit: UT E&PP)

Steps to Managing Bed Bugs

1. Identify
2. Cooperate and educate
3. Inspect thoroughly
4. Control nonchemically and chemically
5. Follow up and re-treat

What to Do About a Bed Bug Infestation

Bed bug elimination can be very difficult because the bugs can hide in cracks and crevices. A pest management professional should be considered for management of this pest as PMPs have the tools needed for crack and crevice applications as well as access to a greater variety of insecticides and equipment. Most PMPs will have a separate contract for bed bugs, which clearly explains their

responsibilities and their client's responsibilities. If a building is used for the temporary or permanent lodging of others (TDA 62-21-124), pesticides must be applied by someone under the direct supervision of a person licensed to apply pesticides. This means pest management in hotels and apartments must be performed by a PMP.

In addition to hiring a pest management professional, a resident will need to help if bed bugs are to be successfully controlled. Excess clutter needs to be removed, including items stored under beds (Figure 7), and either bagged or discarded. Care must be taken so that bed bugs are not dispersed while clutter is reduced. Speak to the PMP before removing clutter and making any other environmental modifications because it may interfere with the service protocol. PMPs must be given access to areas in rooms where cracks and crevices occur. If severely infested mattresses are not encased or heat treated, mattresses and box springs will need to be discarded. These should not be left by the curb or dumpster but taken directly to the dump so others don't acquire your bed bug population. If removal to the dump is not an option, mattresses can be shredded or otherwise mutilated so they can no longer be used for bedding.



Figure 6. The white eggs are about 1 mm long and stick to surfaces. Newly hatched nymphs are light-colored with red eyes. (Credit: UT E&PP)

Finding the Bed Bugs

A heavily infested house may have a distinctive odor similar to "fresh, red raspberries," so odor may help detect areas of infestation. Many PMPs indicate this odor is not present unless the infestation is extensive. Some people are very sensitive to bed bug bites, while others are hardly aware of them, so complaints should not be relied upon to delimit infestations. The elderly are less likely to react to a bed bug bite. Immediately after feeding, bed bugs defecate the semisolid sticky remains of their last meal. Look for tarry or "rusty" spots on bedding, along mattress seams and other places bed bugs feed and hide.

Because they prefer to live close to their host, bed bugs are often found in bedrooms or sleeping areas in the cracks and crevices of headboards, bed frames, mattresses and box springs. They prefer rough, dry surfaces such as wood or fabric. Bed bugs are commonly found in the seams of mattresses; under stapled

fabric and on the wood of the box spring; under plastic box spring corner covers (Figure 8); in cracks in bed frames, bedside furniture and dressers, wallboard and wood paneling; and in clutter under the bed. They can also be found behind pictures; under loose wallpaper; under the edges of wall-to-wall carpeting, baseboards and other wood molding; in ceiling-wall junctures; inside clothing stored in closets and dressers; inside lamps, clocks, phones, televisions and smoke detectors; and in other rooms near the hosts' sleeping areas as well. In hotels/motels, bed bugs are often found in the crevice produced by the headboard support that is screwed into the wall behind the headboard. They are less likely to be found in bedding that is changed on a regular basis. Glue boards, which are excellent trapping devices for brown recluse spiders, are not as effective at trapping bed bugs. Bed bugs and bat bugs may move from an attic area to living spaces through light and fan ceiling fixtures or light switches, pipe penetrations or wall outlets.

To be successful, inspection must go beyond the cursory look; furniture must often be turned over or disassembled. Dismantle the bed, stand the components on edge and look for live bed bugs, their cast skins and dried excrement. Experts recommend at least two people help with the bed breakdown because large mattresses are difficult to maneuver (Figure 9). Check under tags and remove tags if allowed. Box spring bottom coverings or dust covers are often stapled to the frame. This lining can be removed to inspect the inner side of the box spring. Fold the liner towards the middle and place it in a 30-gallon plastic trash bag for removal. Or, the staples can be temporarily removed from three sides to allow a thorough inspection of the box spring interior. Electrical appliances may need to be dismantled to some extent, too. Empty dressers and nightstands and inspect them inside and out. When finished with that, turn them over to inspect the base. Check the cracks where the legs attach and give special attention to cracks, corners and recessed areas.

Sofa beds and even upholstered chairs can harbor bed bugs. Search all seams, tufts, skirts and crevices of upholstered furniture as well as behind and under cushions. Always wear disposable gloves and be careful when flipping a mattress to avoid dislodging bed bugs onto your clothing.



Figure 7. Remove excess clutter including items stored under bed. Note bed bug on packing material. (Credit: UT E&PP)

Research has shown that bed bug monitors such as ClimbUp, BlackOut or SenSci Volcano are effective in detecting bed bug infestations, especially low-level infestations, often missed by visual inspections. These are passive monitors that depend on humans as the attractant, but SenSci Activ lure is available for use with the Volcano. Place monitors under or near the legs of beds and chairs or couches where occupants rest and inspect them after two weeks. Additional monitors can be placed at the wall/floor interface in closets, bathrooms, kitchens, entryways and corners.

Dog detection teams are especially useful in inspecting large areas such as warehouses, retail stores, movie theaters, office buildings, schools and apartment complexes. Recent research indicates the accuracy of a team may vary. The physical presence of bed bugs should always be verified with a visual inspection or use of monitors before any treatment is begun, because dogs sometimes indicate bed bugs are present when they are not. See the UT Extension publication, "SP 788: Detecting Low-Level Bed Bug Infestations in Multifamily Housing," available at bedbugs.utk.edu for further details on detecting bed bugs.

Nonchemical Management

Clothes and other items scattered around the room can harbor bed bugs, disrupt the inspection and cause bed bugs to disperse as items are moved. Carefully follow instructions for reducing clutter and other preparation from your pest management professional.

Laundering, Heating and Chilling

Bag and launder bedding and infested clothing at the hottest temperature that is safe for the fabric. Bedding should be folded into the middle and then bagged to avoid dropping bed bugs. Discard the original bag and place the laundered items in a fresh bag. Alternatively place bedding, clothing, toys, shoes and other items that can withstand the heat in a dryer (>122 degrees F) for 20 minutes to destroy any bed bugs and their eggs. Shoes and other items that may suffer from tumbling may be placed on a removable dryer drying rack. Many dry-cleanable items can safely be placed in a dryer on medium to high heat for 20 minutes. Small portable heat chambers are available to treat luggage, books, etc. They work best when items are loosely placed. Managers of multifamily housing units may wish to purchase larger chambers that can accommodate mattresses and furniture. No matter which method of heating is used for bed bugs, the cracks and crevices in which they take shelter must be exposed to 122 F to kill bed bug eggs, nymphs and adults. The contents of the heat chambers should be monitored with heat sensors to ensure that the recommended core temperature is reached.

Some professional pest management companies offer heat treatments either for furniture, rooms/apartments or structures. Heat treatment is not a simple process and requires training, experience and knowledge. Operators must be trained in how to use

equipment and be familiar with how heat and air flow within various parts of a structure. Propane or electricity (generator or home circuits) is the source of heat, and fans help direct air flow. Sensors are placed throughout the treatment area to monitor temperatures during treatment. Customers are given a list of items that may need to be removed and instructions for preparation. Operators should remain on site during the heat treatment so that heaters, air flow and fans can be adjusted as necessary. Containers or trailers equipped with heaters and fans similar to those used to treat rooms and structures may be used to treat furniture. A company should offer a printout of the monitoring process to the customer to verify that sensors reached the recommended temperature of 120 to 140 F to eliminate an infestation. Time of heat treatment will vary with type of structure, level of infestation, level of clutter and air flow management. Pesticides, such as insecticidal dusts, may be applied in wall voids as a supplement to heat treatment to prevent bed bugs from moving away from the heat before they are exposed to lethal temperatures.



Figure 9. Large mattresses are difficult to maneuver so at least two people should work together. In hotels, check behind the headboard support, too. (Credit: UT E&PP)



Figure 8. Bed bugs can be found in tight spots around the bed, including under the plastic corner cover. (Credit: UT E&PP)

Items that would be damaged by heat may be placed in a home freezer. Use an indoor/outdoor thermometer to ensure temperatures in the infested materials reach 0 F, and then maintain this temperature for at least four days. Wrap items in plastic to protect them against moisture and condensation; anything that is valuable or irreplaceable, such as antique books or artifacts and electronics with LCD displays, should not be frozen. If in doubt about whether or not an item can be treated by heat or cold, check with a pest management professional or the manufacturer.

Natural Enemies

While there are several species of ants and spiders, a centipede, a pseudoscorpion, as well as a mite that reportedly prey on bed bugs, all of them would also be considered pests inside structures.

Steam and Vacuum Application

Because of the safety risk involved with chemical treatment of mattresses, sofas or other furniture that people touch, some alternative methods have been developed. Commercial steamers produce a low-vapor, high-temperature (220 F) steam that when applied to seams, tufts, button-holes, crevices and folds of mattresses, box springs, sofas/hide-a-beds, love seats, chairs and other similar furniture should kill all bed bug life stages contacted. Use a steamer with at least a one gallon capacity and adjustable steam volume controls. Monitor surface temperatures with an infrared thermometer to make sure that they reach 160 to 180 F immediately after the steam wand has passed over the area. Use only upholstery (triangular head) and floor (rectangular head) attachments to apply steam, not a small pinpoint nozzle, which may blow the bed bugs away before they are killed. When treating upholstered furniture, first apply steam to an inconspicuous area to see if fabric damage results. It is important to use a low-vapor steam because moisture may lead to mold growth. Operating a fan after treatment will help remove moisture from the area. Steam cleaning will kill only the adults, nymphs and eggs in actual contact with the steam. Steam will penetrate up to 3/4-inch into fabrics and 2 3/8 inches into gaps. It is possible that bed bugs deep in a mattress may not be exposed to the steam and thus not affected. Steaming usually must be repeated. Always follow the manufacturer's directions for operating a steamer. Steam is under pressure and can burn. On start up or after a rest, machines can spit out hot water; direct the attachment onto a towel to absorb the moisture before proceeding.

Vacuuming with a crevice tool along edges of the beds, mattresses, etc., can also help reduce bed bug populations. Place the toe end of a knee high stocking into the extension tube and fold the open knee end over the end of the tube. Then place the crevice tool on the extension tube. The stocking will prevent captured bugs from entering the hose or the rest of the vacuum. Tie off the stocking when done and discard.

Operators of thermal remediation equipment suggest using vacuums designed for pest management in conjunction with heat treatment. Bed bugs move to cooler areas as temperature increases and are easy to capture with a vacuum. Drawing hot air into the vacuum will kill captured bed bugs and eggs.

Chemical Management

In the distant past, bed bug infestations were treated by spraying an entire room, including beds, floors, walls and furniture, with DDT. Although this is no longer permitted, thoroughness is still of the utmost importance. Treatments are now targeted to cracks and crevices.

As bed bugs and their harborage are found during inspection, treat these infested areas with a crack-and-crevice or void application of a dust, spray or aerosol registered for this purpose. Dusts tend to persist in voids longer than sprays because they rest on the surface. It is imperative to locate and subsequently treat as many cracks and crevices as possible where bed bugs are found. Be thorough. Even though bed bugs usually occur in clusters, single bugs or eggs are sometimes found. Use a bright flashlight. A PMP may even use a flushing agent. Flushed bugs can be vacuumed. Inspection and treatment of a home can and should be lengthy. PMPs could spend up to four hours inspecting for bed bugs in a one-room apartment.

Most of the pesticides available to the general public aren't effective against bed bugs. Bed bug populations from various areas throughout the country are resistant to pyrethroids, insecticides with names ending in "thrin" and the active ingredient in many over-the-counter pesticides. Bed bugs directly contacted by a pyrethroid spray may die, but bugs contacting the dried spray are likely to survive. PMPs are recommended for management because they have experience locating the bugs and have access to other pesticide chemistry. Insecticides suggested for bed bug control are listed in the UT Entomology and Plant Pathology publication, "PB 1690: Insect and Disease Control Manual," located at ag.tennessee.edu/EPP/Pages/Redbook.aspx.

Treat crevices in bedframes, baseboards, closets and wood paneling, under edges of wall-to-wall carpeting, or other wall/floor material interfaces, behind wall-mounted items, ceiling lights and fan fixtures and any other places that may harbor bed bugs (Figure 10). After pesticide applications, caulk cracks and crevices. Avoid spray runoff if applying liquid insecticides onto surfaces and into cracks. Do not apply liquids to electrical components. Multiunit structures require frequent inspections and perhaps repeated applications. If an infestation in an apartment building or hotel is localized, all units sharing a wall, floor or ceiling with the infested area and across the hall should be inspected and/or monitored. If birds such as swallows, chimney swifts, or pigeons or bat hosts are located and removed, the area they inhabited should be inspected for bed bugs and bat bugs, should be treated if these bugs are found, and the structure should be pest-proofed (see UT Extension publication, "PB 1303: Managing Pests Around the Home") to prevent future animal infestations.

Fumigating a structure is another chemical option. PMPs must have a special license to perform fumigation. Whole structures can be fumigated for bed bugs, but this would only be recommended in extreme cases where bed bugs have infested an entire structure or if treating all the cracks and crevices was difficult, as in a log cabin. The process is costly and may require up to several days to treat and aerate.

All residents must be evacuated before treatment, and the structure secured to prevent entry. The whole structure is tented and sealed before a pesticidal gas, sulfuryl fluoride, is released into the structure through a tube from the outside. If tenting is not possible, windows and other openings can be taped and sealed.

Before anyone is allowed to re-enter, the structure is ventilated and aerated and the fumigant concentration in the structure monitored to make sure that it is below legal limits. Fumigation may also be performed in containers to treat furniture or vehicles. One treatment with fumigation is usually sufficient for control, although no residuals remain for future control. Some items must be protected or removed during treatment to avoid damage. Fumigation requires considerable time for the PMP, but preparation time is usually minimized for the consumer.

Unless the infestation is low-level, one chemical treatment may not be sufficient to obtain satisfactory control. In an uncluttered apartment, often three treatments or more are necessary. Passive bed bug monitors can be valuable in determining if an infestation has been eliminated. Supplement visual inspections by placing monitors both in and away from sleeping/resting areas. Check them at two-week intervals for a couple of months. If no bed bugs are detected in the monitors after two months, the occupant can be 97 percent confident that the infestation was eliminated.

What About the Bed?

Do I have to throw out my bed if it is infested with bed bugs? Ideally, if a mattress is intact and has no holes or tears, bed bugs (eggs, nymphs and adults) could be removed with a vacuum and crevice tool or killed by dry steam. If holes or tears are present, bed bugs may be deep inside the mattress and may be unaffected by such treatments. Chemicals are also available to treat mattresses. If you choose to keep a bed, covering the mattress and box spring with bed bug proof mattress encasements, such as those produced by Protect-a-bed or Mattress Safe, can prevent the bugs from feeding through the encasement and prevent future infestations inside. Bugs taking shelter on the outside of the encasement would be visible during inspection. Some pest management companies will treat only the seams, tufts and crevices of bed parts and will not spray the mattress surface or other areas of the bed that the client may contact. Others may cover the sprayed mattress with an encasement. Vacuuming beds prior to encasement may be more comforting to residents attempting to sleep on a bed bug-infested mattress. Beds and other difficult-to-treat items may be heat treated or fumigated to kill bed bugs.

How to Avoid Infestations

Because bed bugs hide very well and are mobile, it is difficult to prevent them from moving from place to place. The following guidelines will help you avoid bringing bed bugs into your home.

1. Be informed about the characteristics of bed bug eggs, nymphs and adults as well as their feces and shed skins. The next time you stay in a hotel, have someone assist you in inspecting behind the headboard, along the mattress seams, or other accessible cracks and crevices.
2. Place luggage on the luggage rack or in the bathtub in hotels. Seal luggage or its contents in a plastic bag. Don't use the chest of drawers.
3. Inspect luggage for bed bugs before leaving the hotel or bringing it into a house. Either place luggage in a heat chamber or vacuum both the inside and outside of the luggage and discard the vacuum bag. Store luggage in a plastic bag after vacuuming.



Figure 10. Empty dressers and nightstands and inspect them inside and out. When you are finished with that, turn them over to inspect the base. Check the crack where the legs attach and give special attention to cracks, corners and recessed areas. Can you find all the cracks and crevices that should be inspected and treated as needed? (Credit: UT E&PP)

4. Place dry clothing in a clothes dryer on medium to high heat for 20 minutes.
5. When acquiring used or rented beds, bedding, furniture and other items that may harbor bed bugs, inspect them before purchasing or bringing them into your home.

What Not to Do

1. Don't use foggers to treat for bed bugs. They do not work. Bed bugs live in cracks and crevices that foggers cannot penetrate.
2. Do not use ineffective alcohol, household cleaners, moth balls, dryer sheets, or ultrasonic pest repellers.
3. Don't store items under the bed. Periodically eliminate clutter.
4. Don't move items from an infested room to another room.
5. Don't depend on bagging things and placing them in the sun or a hot car to kill bed bugs.

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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.

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