



Pesticides: Controlling Pests

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While bed bugs are not known to transmit disease, their presence is unwelcome and has presented difficult challenges and distress to many people. Experts suspect the resurgence is associated with more international and domestic travel, lack of knowledge necessary to prevent infestations, increased resistance of bed bugs to pesticides, and ineffective pest control practices. The encouraging news is that there are ways to control bed bugs. While there is no chemical "silver bullet" or quick fix, there are effective strategies involving both non-chemical and chemical methods.

Resources

- [Bed Bug Product Search tool](#)
- [Top Ten Bed Bugs Tips](#)
- [Joint Statement on Bed Bug Control](#)

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Identifying Bed Bug Infestations

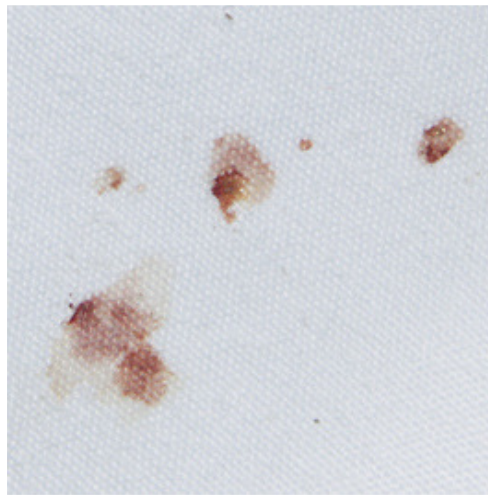
Much of the time, a bed bug infestation is only suspected when bites appear on a person. Oftentimes, the bites are misidentified, thus allowing infestations to go unnoticed, which gives the bed bugs time to spread to other areas of the house.

When cleaning, changing bedding, or staying away from home, look for:

- Dark spots (about this size: ●) which are bed bug excrement and may bleed on the fabric like a marker would
- Eggs and eggshells, which are tiny (about 1mm) and white
- Skins that nymphs shed as they grow larger
- Live bed bugs
- Rusty or reddish stains on bed sheets or mattresses caused by bed bugs being crushed



Canvas strap of old box spring covering that is housing adults, skin castings, feces, and eggs. (Photo courtesy of Dr. Louis Sorkin)



Close up of blood stains on pillow (L. Sorkin)



Close up of eggs on cardboard (H. Harlan)

Treating Bed Bug Infestations

Integrated Pest Management

Integrated Pest Management (IPM) is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices. IPM programs use current, comprehensive information on the life cycles of pests and their interaction with the environment. This information, in combination with available pest control methods like pesticides, is used to manage pest damage by the most economical means, and with the least possible hazard to people, property, and the environment.

IPM methods for bed bugs include:

- Inspecting infested areas, plus surrounding living spaces
- Checking for bed bugs on luggage and clothes when returning home from a trip
- Looking for bed bugs or signs of infestation on secondhand items before bringing the items home
- Correctly identifying the pest
- Keeping records – including dates when and locations where pests are found
- Cleaning all items within a bed bug infested living area
- Reducing clutter where bed bugs can hide
- Eliminating bed bug habitats
- Physically removing bed bugs through cleaning
- Using pesticides carefully according to the label directions
- Following up inspections and possible treatments
- Raising awareness through education on prevention of bed bugs

For more information on IPM visit <http://www.healthyhomestraining.org/ipm/>. EXIT Disclaimer

Non-chemical treatments

- Wash and dry bedding and clothing at high temperatures to kill bed bugs.
- Heat infested articles and/or areas through to at least 113 °F (45 °C) for 1 hour. The higher the temperature, the shorter the time needed to kill bed bugs at all life stages.
- Cold treatments (below 0 °F (-19 °C) for at least 4 days) can eliminate some infestations. Again, the cooler the temperature, the less time needed to kill bed bugs.
- Use mattress, box spring, and pillow encasements to trap bed bugs and help detect infestations.

Chemical treatments

Bed Bug Pesticide Alert

- Never use a pesticide indoors that is intended for outdoor use. It is very dangerous and won't solve your bed bug problem.
- Using the wrong pesticide or using it incorrectly to treat for bed bugs can make you sick, may not solve the problem, and could even make it worse by causing the bed bugs to hide where the pesticide won't reach them.
- Check if the product is effective against bedbugs -- if a pest isn't listed on the product label, the pesticide has not been tested on that pest and it may not be effective. Don't use a product or allow a pest control operator to treat your home unless bed bugs are named on the product label.
- Before using any pesticide product, READ THE LABEL FIRST, then follow the directions for use.
- Keep in mind that any pesticide product without an EPA registration number has not been reviewed by EPA, so we haven't determined how well the product works.

Pesticides are one component of a [comprehensive strategy](#) for controlling bed bugs. Currently, there are over 300 products registered by EPA for use against bed bugs – the vast majority of which can be used by consumers. Several classes of chemicals are utilized in these products -- each class share a similar mode of action, or way in which the chemical affects the biological functions of a bed bug.

To help you find a product, EPA has developed a [Bed Bug Product Search tool](#) to help you find a product that meets your needs.

If you find that a particular chemical treatment seems to be ineffective, please read [When Treatments Don't Work](#) before reapplying or trying a different product. You may want to consult a pest management professional to inspect your residence and, if needed, apply approved pesticides to treat any infestation. For assistance with choosing a pesticide registered for consumer use, you may also check with the Cooperative Extension Service office in your area.

Preventing Bed Bug Infestations

Bed bugs are very successful hitchhikers, moving from an infested site to furniture, bedding, baggage, boxes, and clothing. Although they typically feed on blood every five to ten days, bed bugs can be quite resilient; they are capable of surviving over a year without feeding.

A few simple precautions can help prevent bed bug infestation in your home:

- Check secondhand furniture, beds, and couches for any [signs of bed bug infestation](#), as described above before bringing them home.
 - Use a protective cover that encases mattresses and box springs which eliminates many hiding spots. The light color of the encasement makes bed bugs easier to see. Be sure to purchase a high quality encasement that will resist tearing and check the encasements regularly for holes.
 - Reduce clutter in your home to reduce hiding places for bed bugs.
 - When traveling:
 - In hotel rooms, use luggage racks to hold your luggage when packing or unpacking rather than setting your luggage on the bed or floor.
 - Check the mattress and headboard before sleeping.
 - Upon returning home, unpack directly into a washing machine and inspect your luggage carefully.
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Hiring Pest Management Professionals

Getting a pest management professional (PMP) involved as soon as possible rather than taking time to try to treat the problem yourself is very effective at preventing further infestations. Each pest management company should have instructions for residents on how to prepare the unit for a treatment which will include laundering and cleaning.

The PMP will inspect your residence, take apart furniture if necessary and use vacuums, heat and pesticides to treat the infestation.

[EPA's Citizen's Guide to Pest Control and Pesticide Safety \(PDF\)](#) (54 pp, 2.37M, about [PDF](#)) offers more tips on how to choose a pest control company.

Bed Bug Biology

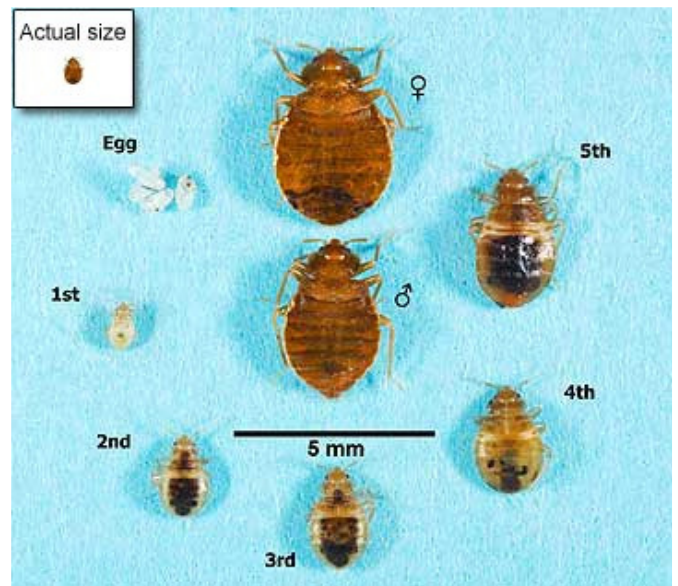
The common bed bug (*Cimex lectularius*) has long been a pest – feeding on blood, causing itchy bites and generally irritating their human hosts. The Environmental Protection Agency (EPA), the Centers for Disease Control and Prevention (CDC), and the United States Department of Agriculture (USDA) all considers bed bugs a public health pest. However, unlike most public health pests, bed

bugs are not known vectors for the transmission and spread of diseases.

Knowing what to look for is the first step in controlling bed bugs. Generally, adult bed bugs are 1/4 to 3/8 inch (4-5mm) long, brown in color, with a flat, oval-shaped body; while young bed bugs (also called nymphs) are smaller and lighter in color.

When not feeding, bed bugs hide in a variety of places. Around the bed, they can be found near the piping, seams and tags of the mattress and box spring, and in cracks on the bed frame and head board.

If the room is heavily infested, you may find bed bugs in the seams of chairs and couches, between cushions, in the folds of curtains, in drawer joints, in electrical receptacles and appliances, under loose wall paper and wall hangings -- even in the head of a screw. Since bed bugs are only about the width of a credit card, they can squeeze into really small hiding spots. If a crack will hold a credit card, it could hide a bed bug.



Life cycle of the bed bug, starting from the top left, moving counterclockwise: eggs (1mm), 1st stage nymph (1.5 mm), 2nd stage nymph (2 mm), 3rd stage nymph (2.5 mm), 4th stage nymph (3 mm), 5th stage nymph (1.5 mm), unfed adult (5.5 mm), and fed adult. Photo Courtesy of Stephen Doggett, Department of Medical Entomology, Westmead Hospital, Sydney, Australia

Common Bed Bug Myths

Myth: You can't see a bed bug.

Reality: You should be able to see adult bed bugs, nymphs and eggs with your naked eye.

Myth: Bed bugs live in dirty places.

Reality: Bed bugs are not attracted to dirt and grime; they are attracted to warmth, blood and carbon dioxide. However, clutter offers more hiding spots.

Myth: Bed bugs transmit diseases.

Reality: There are no cases that indicate bed bugs pass diseases from one host to another. Lab tests have shown that it is unlikely that the insect is capable of infecting its host.

Myth: Bed bugs won't come out if the room is brightly lit.

Reality: While bed bugs prefer darkness, keeping the light on at night won't deter these pests from biting you.

Myth: Pesticide applications alone will easily eliminate bed bug infestations.

Reality: Bed bug control can only be maintained through a comprehensive treatment strategy that incorporates a variety of techniques and vigilant monitoring. Proper use of pesticides may be one component of the strategy, but will not eliminate bed bugs alone. In addition, bed bugs populations in different geographic areas of the country have developed resistance to many pesticidal modes of action. If you're dealing with a resistant population, some products and application methods may only serve to make the problem worse. It is a good idea to consult a qualified pest management professional (PMP) if you have bed bugs in your home.

In case of emergency, call local Poison Control: 1-800-222-1222

Questions and Answers

- Read about [frequently asked questions and answers](#) on bed bugs.

For More Information

- [National Bed Bug Summit - April 2009](#)
- [What's Working for Bed Bug Control in Multifamily Housing: Reconciling best practices with research and the realities of implementation \(PDF\)](#). (43 pp, 603 k, about [PDF](#)) [EXIT Disclaimer](#)
- [Bed bug fact sheets \(several topics, various settings, English and Spanish\)](#)
- [Understanding and Controlling Bed Bugs](#) [EXIT Disclaimer](#)
- [Bed bugs are back! An IPM Answer](#) (5 pp, 380 k, about [PDF](#)) [EXIT Disclaimer](#)
- [Bed bugs \(University of Kentucky\)](#) [EXIT Disclaimer](#)
- [The Bed Bug Hub: One-Stop Shop for Bed Bug Information](#) [EXIT Disclaimer](#)
- [New York City Bed Bug Resources](#) [EXIT Disclaimer](#)

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