



BED BUGS AND YOU

[Top Ten Tips About Bed Bugs \(.pdf\)](#)

Traditional approaches to bed bug control that rely on a single application of a pesticide are no longer effective. Pesticides are only one tool in a large toolbox of other control measures. Modern control of a bed bug infestation requires a multifaceted approach, which is called Integrated Pest Management (IPM). IPM tools to attack a bed bug problem include cleaning and eliminating clutter; removal and killing of bed bugs and eggs using vacuuming, steam, heat, and/or cold treatment; using harborage barriers like mattress encasements; and application of pesticides by a certified pest controller.

The Missouri Department of Health and Senior Services recommends people keep a level head when they face a bed bug problem. When we use the tools in our IPM toolbox, we decrease our dependence on pesticides. At the same time, we help preserve the effectiveness of chemical pesticides into the future by limiting bed bugs' ability to develop new resistance. We also reduce the chance of accidental harm from pesticides that are not suitable for use in the home.

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Understanding What Bed Bugs Can Do To Me

What are bed bugs?

- Small, wingless, reddish-brown bugs that eat human blood
- Oval shaped, ranging in size from a poppy seed to an apple seed
- Tend to congregate, secretive and usually nocturnal
- Travel from place to place in luggage, clothes, boxes and used furniture
- Infestations can move between apartments/motel rooms through small cracks



Why should I be concerned about bed bugs?

There is no evidence of disease transmission (e.g., HIV, hepatitis) per CDC, but infestations can lead to other health issues:

- Significant psychological distress, causing anxiety and loss of sleep

- Economic hardships because bed bugs typically are not controlled with do-it-yourself measures

How do people get bed bug bites?

- Bed bugs are most active when we sleep.
- They crawl onto exposed skin, inject a mild anesthetic and suck up a small amount of blood.
- Most people never feel the actual bite.
- Through long association with human beings, they are adept at establishing themselves in and around the bedroom.
- Infestations of bed bugs can spread into other rooms of the household and even into adjacent apartments and motel rooms.

What will a bed bug bite do to me?

- Most people's reaction to bed bug bites can take a few minutes but for some people, reactions can take as many as two weeks to appear.
- Different people's reactions to bed bug bites range from no reaction to very severe reactions.
- The area may become red and itchy due to an allergic reaction to bed bug saliva.
- Allergic reactions can lead to scratching and secondary infections.
- A bed bug infestation can cause significant psychological distress, such as anxiety and loss of sleep.

How do I know if my bites are from bed bugs?

- It is difficult, if not impossible, to distinguish bed bug bites from those of other biting pests
 - Bed bug bites can resemble the bites of mosquitoes; fleas; spiders; ticks; head, body, and pubic lice; bird and rodent mites; and scabies mites
 - Bed bug bites can develop into small bumps or large itchy welts
 - Bites from a large number of bed bugs can present as a widespread, red rash
 - Severe reaction to bites may be accompanied by a systemic reaction of fever and/or malaise
- If you or someone you know has bites consider the following:
 - Bed bugs commonly feed on the arms, shoulders and legs, i.e., areas not covered while sleeping
 - The first sign of bed bugs is usually a group of bites

Do I need to visit my doctor if I suspect I have bed bug bites?

- If you have a medical emergency, contacting DHSS is not the proper way to get immediate help. Instead, please contact your health care provider or go to the nearest emergency room.
- Your medical care provider may not be able to determine from the bite reaction alone if the cause is actually bed bugs.
- Your care provider may consider the possibility that you have bites from other insects, an antibiotic reaction, a scabies infection, a food allergy, hives, a Staphylococcus infection, chicken pox, or any number of other conditions.
- There is no specific treatment for bed bugs, but your care provider may recommend treatment with antihistamines and corticosteroids for itching and swelling.

I Think My Home Has Bed Bugs

What do I look for when I suspect a bed bug infestation?

- You will be looking for any of the following: bed bugs; eggs; blood spots, fecal stains; empty skins left after molting; and a sweet or musty odor
- Bed bugs can be easily confused with other small household insects, including fleas, carpet beetles, spider beetles, and newly hatched cockroaches (nymphs).
- It can be very difficult for a non-professional to find bed bugs
 - Ask for help!
 - For seniors, enlist a young person with good vision
 - If mobility is a problem, ask family members and friends
 - Call the building manager, landlord, or your social service provider
 - Some certified pest controllers offer free inspections
 - Assemble your search tools
 - Use a strong flashlight, magnifying glass, and a probing tool like a pointed nail file or chop stick for examining seam edges.
 - Sticky tape or tissues to capture specimens
 - Have on hand plastic zip-top bag for collecting specimens
 - Until your bugs are identified, store in a plastic bag in the freezer
 - In a low to moderate infestation, the bed bugs will be concentrated close to sleeping areas.
 - Check for bed bugs hiding in the mattress, box spring, and bed frame. Be sure to look under the mattress and along the seams (edges).
 - Search other furniture near the bed, like end tables.
 - Items away from the sleeping area will be at a low risk of infestation
 - Move slowly and avoid disturbing hiding bugs, so they don't scatter.

I found something that could be a bed bug. How can I know for sure?

- The University of Missouri Extension Service has an insect identification program.
 - If the local extension office identifies it, there isn't a fee; however, if they have to send it to the diagnostic clinic in Columbia, there is a fee.
 - People with suspected bed bugs should put them in a tightly sealed container with a cotton ball that is saturated with alcohol.
 - Here is a link to the instructions and form for submitting a specimen:
<http://extension.missouri.edu/publications/DisplayPub.aspx?P=g7555>
- Try calling a local college or university and ask for an entomologist (a person who is an expert on insects)
- An experienced, certified pest controller should be able to tell you what you have.
- If you live in [multiple-units housing, such as an apartment, long-term care facility](#) or dormitory, bring any insects you find to your landlord or building manager as soon as possible. The control of bed bugs in multiple-units housing usually requires a coordinated Integrated Pest Management control plan, involving the cooperation of some or all of your neighbors.

A Picture is Worth a Thousand Words

Bed bug control is most effective when an Integrated Pest Management (IPM) approach is used. The first step to any IPM effort is to correctly identify the pest. This is especially important for bed bug infestations because some treatments cannot control these insects.

- [Armed Forces Pest Management Board Image Database](#)
- [University of Missouri Extension Service YouTube Bed Bug Video](#)
- [Centers for Disease Control and Prevention Image Library](#) (digitally-colored scanning electron micrographs)

How Do I Get Rid of Bed Bugs Without Harming My Family?

Can I manage a bed bug infestation on my own?

- The DHSS recommends that homeowners hire a pest control professional licensed by the MO Department of Agriculture (MDA) to evaluate what type of pest is present, and to exterminate them. Homeowners are often asked to assist in the extermination by removing clutter. The MDA maintains a list of Missouri licensed pesticide applicators. The list can be searched here: <http://www.kellysolutions.com/MO/Applicators/index.asp>.
- If you live in [multiple-units housing, such as an apartment, long-term care facility](#), or dormitory, you should talk with your landlord or building manager as soon as possible. The control of bed bugs in multiple-units housing usually requires a coordinated Integrated Pest Management control plan, involving the cooperation of some or all of your neighbors. This is not a problem you should take on yourself.
- If you choose to use pesticides in your home to treat for bedbugs, you must read, understand and follow the label instructions carefully. Several classes of chemicals are registered for use against bed bugs.
 - For assistance in choosing an appropriate pesticide, contact the local University of Missouri Cooperative Extension office: <http://extension.missouri.edu/directory/Places.aspx>
 - The EPA has a [bed bug product search tool](#) you can use to identify pesticides registered for use against bed bugs in various locations.

What is so difficult about the control of bed bugs?

Because of pesticide resistance and their hardy, secretive nature, it is very difficult for an untrained consumer to manage a bed bug infestation by themselves. Bed bugs are sometimes controlled by non-chemical means alone; however, this approach can be very difficult, potentially less effective, and often more resource intensive. Shortcuts or omitted steps increase the likelihood of an infestation continuing. The most effective bed bug control strategy will start with a careful, thorough inspection by a pest control professional of all known and suspected spots where the bugs may be harboring. If bed bugs are discovered, the pest control professional will develop a treatment and control strategy with the customer depending on the extent of the infestation. Achieving elimination of a bed bug infestation requires a multifaceted approach, which is called Integrated Pest Management (IPM).

What are the elements of an Integrated Pest Management (IPM) program for controlling bed bugs?

A comprehensive IPM program to control bed bugs may include a number of methods including:

- Proper identification of the pest
- Using monitoring devices
- Removing clutter where bed bugs can hide
- Applying heat treatment
- Vacuuming
- Sealing cracks and crevices to remove hiding places
- Using non-chemical pesticides (such as diatomaceous earth)
- Judicious use of effective chemical pesticides
- Follow up inspections/re-treatments



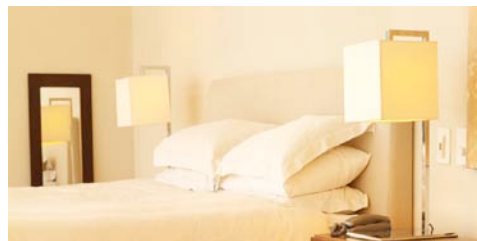
What if my treatment isn't controlling the problem?

- Bed bug control is most effective when an Integrated Pest Management approach is used with both chemical and non-chemical measures.
- The assistance of a pest control professional may be needed.

Shouldn't ordinary garden pesticides be safe to use in my house – don't we put them on our food? Also, I already have several bug sprays like wasp killer, roach spray, and ant bait – can I use these to keep from being bitten by bed bugs?

CAUTION: Lawn and garden pesticides, wasp killer and roach sprays and ant bait were not designed to kill bed bugs. Always read and follow label directions for any pesticide product, and make sure the pesticide is intended for treating bed bugs. The EPA has a [bed bug product search tool](#) you can use to identify pesticides registered for use against bed bugs in various locations. The worry and frustration that bed bug victims feel is very real and may tempt some people to use desperate measures. NEVER substitute different pesticides that are not registered for bed bugs – you run the risk of you, your family and friends, and your pets being exposed to the wrong kind of pesticide. Always read and understand the label of any pesticide you use. Never spray bed bug pesticide on:

- Skin
- Bedding
- Mattress
- Pillows
- Clothing
- Children's toys



What about reports on the Internet of successful do-it-yourself, home remedies?

As bed bug victims become more desperate, serious injury may result from such home remedies or misuse of pesticides. DO NOT substitute different pesticides not registered for bed bugs, such as those for garden or agriculture use. It is dangerous and illegal to apply professional-use concentrated pesticides bought on the Internet. Pest control firms have reported seeing many ineffective and potentially dangerous measures used by do-it-yourselfers, including:

- Rubbing alcohol
- Ammonia

- Bleach
- Fire
- Smoke
- Kerosene
- Essential oils
- Wasp spray
- Bug bombs



Why doesn't the Environmental Protection Agency (EPA) allow certified pesticide applicators to use DDT, which was successful for treating bed bugs in the 1940's and 1950's?

The banning of DDT has been popularly cited as a factor that allowed the current bed bug resurgence. However, DDT resistance in bed bugs was widely recognized decades ago, and even if it were available now, it is unlikely it would be effective. Due to the widespread use of this pesticide in the 1950s and 1960s, resistance to DDT became more common in bed bugs. Resistance develops when mutations in the genetic code allow a few individuals to survive pesticide treatment. Though DDT is rarely used today, mutations in the genetic code that favor resistance to this pesticide are still present in modern bed bug populations.

Traditional approaches to bed bug control that rely on pesticides are no longer effective. Pesticides are only one tool in a large toolbox of other control measures. No single tool or activity, used alone, will eliminate bed bugs, including the use of DDT or other pesticides. By approaching bed bug control on multiple fronts, we decrease our dependence on pesticides while at the same time help preserve the effectiveness of chemical pesticides into the future by limiting bed bugs' ability to evolve additional resistance.

I Don't Have Bed Bugs Now, But I Worry I Might Accidentally Bring Them Home

Should I go ahead and treat my home for bedbugs using pesticides?

Use of pesticides should only be done as part of a comprehensive approach to treat for bedbugs. "Preventive" or preemptive use of pesticides in the home needlessly exposes you and your family to pesticide residues and can contribute to pesticide resistance. Chemical methods should not be the first or only approach and should not be used without first properly identifying the insects are bed bugs. Identification may best be done by an MU University Extension expert or a pest control professional.

How can I prevent a bedbug infestation?

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.

- 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.

What if I found bedbugs in my motel room?

- Contact the department's Bureau of Environmental Health Services at 573-751-6095. Or you can contact the local public health agency (LPHA) directly. Either agency will need to know the name of the establishment, the address, the dates of stay and the room number(s).
- An investigation will be performed by the LPHA of the rooms identified and the adjacent rooms. If evidence of bedbugs is found, the room will be taken out of service and a licensed pest control operator will be contacted to evaluate and take appropriate action.
- Inspect your luggage and its contents before bringing them into your home.
 - Keep your travel clothes separate from other laundry.
 - Wash them in warm water right away and dry in the dryer.
 - Vacuum your luggage to get rid of any hitchhiking bed bugs.

What if I work in a high-risk occupation, such as a housing inspector or in-home nursing?

There are many reliable resources available on the Internet suitable for the general public, but for workers who are involved in housekeeping, facilities maintenance, medical and social work, more detailed guidance is necessary. The New York State Integrated Pest Management Program has issued a very comprehensive guidance document titled "Guidelines for Prevention and Management of Bed Bugs in Shelters and Group Living Facilities." This guidance is available for download on the Internet and has sections that should address most workers' concerns:

- [How to avoid picking up bed bugs at work](#)
- [Bed bugs for the medical service provider](#)
- [How social workers can provide emotional and educational support](#)
- [Compassionate screening of potential homeless shelter or emergency housing clients](#)

I Live in an Apartment Care or Other Multi-Units Housing

I've heard there are bed bug infestations in several neighboring apartments. Is there anything I can do to keep bed bugs from spreading into my apartment?

Landlords and building managers should encourage tenants to report bed bugs as soon as they know of a problem, especially in multiple unit facilities, like apartments, long-term care facilities, dormitories and group homes. If a bed bug problem is not addressed immediately, it can grow quickly and spread throughout a facility room by room. In spite of their small size, bed bugs are mobile, able to move to adjacent rooms through cracks in plaster, spaces between floor boards, or joints in baseboards. In addition, do-it-yourself pesticide treatments that do not kill bed bugs, such as bug bombs or roach spray, can cause bed bugs to scatter and seek out new hiding places in adjacent rooms.

Bed bug infestations in multiple unit facilities require a coordinated effort that includes cooperation of the residents and the landlord or property management. Building management and staff should expect to provide education and other assistance to their residents in order to prevent and control the spread of bed bugs. In a similar way, tenants should expect they will be asked to cooperate with staff and management in preventing and controlling bed bugs whether their individual living space is infested or not. Everyone involved should practice patience, understanding that they are in the middle of a difficult situation and their lives will probably be disrupted because of the bed bugs.

A coordinated facility-wide assessment and treatment plan should be based on the principles of Integrated Pest Management, including:

- Confirmation of a bed bug infestation and not just roaches or fleas
- Inspections by knowledgeable pest control technicians or trained facility management staff to identify the source of the infestation
- Identification of all possible hiding spots, including clutter, furniture, and floor and wall crevices
- Knock-down of the bed bug infestation by removing clutter as well as vacuuming and cleaning before a pesticide application
- Using a low-impact pesticide, preferably applied by a trained and licensed pest control professional
- Follow-up inspections and/or monitoring to ensure the infestation is controlled

What other resources are there for people living in multi-unit facilities, such as apartments, shelters, dormitories and group homes?

- Under Missouri statutes, municipalities and counties can enact sanitation and building codes that may require landlords to address insects and other vermin, such as mice or rats. Check with your city government or council representative to see if your local government has enacted any codes like this in your area.
- The Missouri Attorney General’s Office publishes a consumer guide on the Landlord/Tenant Law. This guide can be accessed at:
<http://ago.mo.gov/publications/landlordtenant.pdf>
- People living in facilities or rental units supported through federal Housing and Urban Development (HUD) programs can call their local Housing Authority to report bed bugs. These community housing programs have regular safety and sanitation inspection programs to ensure that single- and multiple-dwelling units meet minimum, federally-established standards.
- The Cornell University Cooperative Extension has produced an excellent handbook for managers of multi-unit facilities’: [Guidelines for Prevention and Management of Bed Bugs in](#)



Shelters and Group Living Facilities. This guidance was produced through an agreement between the U.S. Departments of Agriculture and Housing and Urban Development. It can be downloaded free from the Internet at

http://www.nysipm.cornell.edu/publications/bb_guidelines/.

I Think Too Much Pesticide Was Applied – My Family and I Feel Sick

ACT NOW if you have question about a possible pesticide poisoning or any other poison related questions

- Call the Missouri Poison Center Hotline at 1-800-222-1222 or 1-314-772-5200 (St. Louis)
- Have the pesticide label available when calling the Missouri Poison Center.

If you suspect that damage or harm has occurred from a pesticide application you can contact the MDA Bureau of Pesticide Control at (573) 751-5504 in Jefferson City to file a complaint about the possible misuse of a pesticide by any applicator. An MDA investigator is notified to make an investigation of the incident as soon as possible.

For non-emergency information on pesticides:

- Call the National Pesticide Information Center at 1-800-858-7378. Help is available between 6:30 a.m. and 4:30 p.m. PT, 7 days a week or visit www.npic.orst.edu
- If you have health questions about adverse health effects of pesticide exposures, you can call DHSS-Bureau of Environmental Epidemiology at **573-751-6102**.

Resources and Getting Reliable Information

The sudden increase in public attention to bed bugs has resulted in a proliferation of quack remedies for treating bites and controlling infestations. Public health departments' primary message is that people need to rely on information from sources that promote science-based recommendations, like DHSS, the CDC and EPA. Public and private universities also provide information that is science-based. Below are some links that can serve as a gateway to reliable information for consumers:



Digitally-colored scanning electron micrograph (SEM) of bed bug. Source: CDC

Reliable Resources for Consumers

<http://www.healthfinder.gov/prevention/ViewTool.aspx?toolId=26>

Top Ten Bed Bug Tips from EPA: <http://www.epa.gov/pesticides/factsheets/bed-bugs-faq-fs.html>

http://www.ipmctoc.umn.edu/Control_of_bedbugs_in_residences_US_Commercial.pdf

<http://www.epa.gov/pesticides/bedbugs/>
<http://www.cdc.gov/nceh/ehs/Topics/bedbugs.htm>
http://nysipm.cornell.edu/publications/bed_bugs/files/bed_bug.pdf
<http://www.nyc.gov/html/doh/downloads/pdf/vector/bed-bug-guide.pdf>
<http://www.youtube.com/watch?v=JHT8mB7xnPg> (MU Extension Service video)
<http://extension.missouri.edu/publications/DisplayPub.aspx?P=G1918>
<http://extension.missouri.edu/publications/DisplayPub.aspx?P=G1915#final>
<http://www.racgp.org.au/Content/NavigationMenu/Publications/AustralianFamilyPhys/2009issues/afp200911/200911doggett.pdf> (Bed Bugs: What the GP needs to know)

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