

Bed Bug Myths — Rely on Research For Facts

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Cimex lectularius, the common bed bug, was once thought to be practically eradicated from the United States. Since 2000, this insect has bounced back with a vengeance, crossing the globe and the United States at the speed of human travel. Entomologists say we are seeing just the tip of the iceberg — the bed bug problem is increasing exponentially with no end in sight.

The Internet is a wonderful place and, for many of us, has enriched our lives immensely, but it is also a place where people can spew inaccuracies about bed bugs. Misunderstandings are passed from person to person all too often. Here are the most common misunderstandings about bed bugs and the facts.

Myth #1: Bed bugs are invisible.

Bed bugs hide during the day and they feed at night, so they are often overlooked, at least in the early stages of an infestation. But they are not invisible. Adult bed bugs are reddish-brown and the size of an apple seed, about 1/4-inch long, although immature bed bugs are smaller. The eggs are tiny; they are about the size of a pinhead and, being light-colored, are easy to overlook.

Myth #2: Bed bugs reproduce quickly.

Bed bugs actually reproduce fairly slowly, compared to other insects. The female house fly, for example, lays 500 eggs over several days. During the



Bed bugs next to staple which held a dust cover underneath a couch.

summertime when temperatures are warm, house flies can go through their life cycle, from egg to adult, in about 10 days.

Recent research from Dr. Dini Millers' research lab at Virginia Tech shows today's female bed bug lays 1–7 eggs per day, but only about 113 eggs in her lifetime. At room temperatures, the life cycle (from egg to adult) takes about 4–5 weeks.

The advantage bed bugs have is they live indoors and are not tied to seasonally-warm temperatures like many outdoor insects are. Even in the wintertime, they are comfortable at room temperatures.

Myth #3: Bed bugs live in mattresses so if I throw it away, I'll get rid of them.

Bed bugs often infest mattresses and box springs because they are close to where people sleep at night. Like other animals, they like to be close to their food. If people fall asleep on the sofa at night, bed bugs will often infest the sofa.

In the bedroom area, the most likely place for bed bugs to hide is the box springs. To find them, tear

the dust cover off the bottom of the box springs, and look for bugs and fecal spots where pieces of wood butt against each other. Another location is near staples; peel back the fabric where it is stapled to the wooden frame.

Once bed bugs are found, it is common for people to throw the bed away in disgust, not thinking about where they will sleep afterward. Sleeping on the floor makes it easy for bed bugs to feed.

And, if you purchase a new mattress and box springs before treatment is complete, new bedding will likely become infested, too.

A better option is to keep the mattress and box springs, if they are reasonably new and in good condition, and encase them to seal bed bugs inside. The best encasements cost \$45–80 for each piece, but it is a lot less than buying new mattresses. If the mattress/box springs are old, ripped, and in poor condition, it does make sense to throw them away and buy new ones. Encasing the new mattress and box springs will protect them from infestation.

Myth #4: Bed bugs can live a year or more without a meal.

In 1941, a research study done by a Japanese researcher named Omori showed adult bed bugs lived longest — about 15 months — at lower temperatures (50°F). But, when held at higher temperatures, they did not live nearly as long. Why is this? Without a blood meal to replenish body fluids, bed bugs desiccate faster at higher temperatures.

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Know how. Know now.

Recent research at Virginia Tech found pesticide-resistant bed bugs — the ones most commonly encountered today — held at 78°F and 69% relative humidity, lived about 3 months.

So, when people ask how long they can wait before renting out a vacant apartment or house that has been infested, these data suggest it largely depends on temperature. At room temperatures, it is safe to say bed bugs may be able to live 3–5 months without a blood meal. If it's cooler, they may survive longer.

Myth #5: I can kill bed bugs by turning off the heat in the wintertime and subjecting the house/apartment to freezing temperatures.

Probably not ... even in Nebraska it may not get cold enough. Bed bugs are much more resistant to low temperatures than to high ones. Millions of years ago, bed bug ancestors lived in caves and parasitized bats. Bed bugs are pre-adapted to surviving well in cold temperatures which actually increases their life span.

Many insects have physiological mechanisms to withstand the cold temperatures of winter. When temperatures get cold slowly over time, water in cells is replaced by substances like ethylene glycol and glycerol which prevent cells from bursting in freezing temperatures.

To kill bed bugs with cold temperatures, “flash freezing” is needed. Based on studies done in his lab at the University of Minnesota, Stephen Kells says it takes 4 days at 0°F to kill bed bugs. He does not recommend using seasonally cold temperatures as a control method, which would include putting suitcases or furniture outdoors during cold weather or turning off heat in infested rooms. Because bed bugs are more tolerant of cold temperatures, these methods may not successfully kill bed bugs.

Most recently, Chanlu Wang, Rutgers University, sealed 3 lb of dry ice and 20 lb of clothing in a heavy duty, 3 ml plastic garbage bag and found all bugs were dead after 24 hours. This technique could possibly be used to disinfect other items, like electronics.

Cold temperatures aren't practical for whole house treatments, although

some cold treatments, like Cryonite (frozen carbon dioxide), may kill bed bugs on mattresses and in wall voids.

Myth #6: I've heard heat will kill bed bugs. I can rent a space heater and save money by doing my own treatment.

Bed bugs *are* susceptible to heat, but they often hide in insulated locations, like under carpets and inside wall voids. To kill them successfully, the heat must be distributed evenly throughout the room and monitored with sensors to make sure it is hot enough. The temperatures also must be sustained for a period of time to allow the heat to dissipate into all bed bug hiding places.

Stephen Kells reports bed bug adults die at 119°F (48.3°C). Eggs are more resistant, dying at 130.5°F (54.8°C). However, Kells believes 122°F is a sufficient threshold for pest control companies, especially when they monitor temperatures throughout the treatment area using temperature sensors.

Companies doing heat treatments seal the room or apartment to prevent heat escape. To promote even temperatures throughout the rooms, they move furniture away from walls, stand mattresses/box springs on end, remove dresser drawers, open closet doors, and use fans to move the air around. After a baseline temperature is reached at all the heat sensors, the heat is sustained for 3–5 hours or more.

We do not recommend do-it-yourself heat treatment because there have been too many cases of fires when people are trying to adapt space heaters for this type of use. Melted window blinds, plastic light covers, and damaged plasma screen television sets have occurred with improperly directed heat. When such high temperatures are used, it is important to use heat equipment specially designed for pest control professionals for pest control.

Myth #7: I've heard DDT was the reason bed bugs were gone so long. We need to bring it back.

Yes, it's true, the use of DDT is one of the reasons bed bugs disappeared for such a long time. But many people do not realize today's bed bugs are resistant to DDT, as well as the pyrethroid class of insecticides. Both DDT and pyrethroid insecticides kill bed

bugs the same way.

New research has shown that today's bed bugs also have a thick cuticle which prevents insecticides from penetrating the body. They also have very high levels of enzymes in their body which convert the toxic insecticide into less toxic chemical and allow the bugs to survive the treatment.

Myth #8: I found products at a store with bed bugs on the label, so they should solve my bed bug problem, right?

Wrong. Manufacturers of many over-the-counter (OTC) products used inside the home have added bed bugs to the label. These products often have the words *bed bugs* prominently on the label to entice people to buy their product. If these are pyrethroid products, it is likely bed bugs are highly resistant to them. Look at the product label and see what insecticide is listed. Most pyrethroids can be identified with a characteristic suffix “-thrin.” For example, permethrin, cyfluthrin, bifenthrin, and deltamethrin are insecticides in the pyrethroid family. Fluvalinate and esfenvalerate are also pyrethroids.

There are also other OTC products which may claim to kill bed bugs. The EPA allows products containing active ingredients on their “25B list” to make pesticidal claims, produce a pesticide label without EPA approval, and market them without any efficacy or safety testing. The active ingredients in this list are considered “safe,” so the EPA has relaxed its normal requirements for pesticide safety testing and label language approvals. To see what active ingredients are on the 25B list, go to www.epa.gov/oppbppd1/biopesticides/regtools/25b_list.htm.

The most effective products are being marketed to pest control professionals which is why we recommend hiring an experienced professional for fastest and safest bed bug extermination.

FOR MORE INFORMATION

For additional resources on bed bugs, go to <http://lancaster.unl.edu/pest/bugs.shtml>. You can bring insects for free identification to the Lancaster Extension Education Center, 444 Cherrycreek Road, Lincoln during office hours Monday–Friday, 8 a.m.–4:30 p.m.