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Bed bugs?!

What tribal housing management & staff should know about these common pests

Statewide Integrated
Pest Management Program

University of California
Agriculture and Natural Resources



Pest problems in housing

- **Major pests:**

- German cockroaches
- **Bed bugs**
- Rodents

- **Minor pests:**

- Ants
- Flies
- Fleas
- Pantry pests



Surveys say: bed bugs are increasingly problematic

- Most (73%) pest management professionals: 'infestations have increased' (2014 – 2015)
- Multi-unit housing complexes experience, on average:
 - five infestations / year
 - some (15%) experience > 20 / year



Bed bug biology

- “true bug” (Heteroptera / Hemiptera)
- piercing-sucking mouthparts
- wingless
- incomplete / gradual metamorphosis
- obligate haematophages



Bed bug myths

- bed bugs 'bites' are very characteristic; anyone can easily recognize them after a bit of training

Bed bug myths

- bed bug bites are very characteristic; anyone can easily recognize them after training
- Truth: there is no such thing as a 'typical bed bug bite'. Confirmation is impossible without a specimen or clear signs.

Is there really a bed bug problem?

- Impossible to know based on dermal symptoms alone
- No such thing as a 'typical bed bug bite'
- **Confirmation requires signs and / or specimens!**



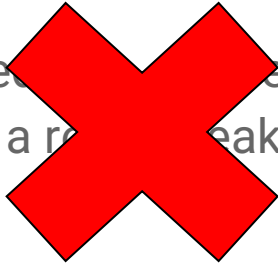
Bed bug myths

- Bed bugs sometimes 'bite' three times in a row ('breakfast, lunch, and dinner')



Bed bug myths

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- Truth: multiple bed bugs may feed at once. Sheets and clothing create linear barriers.

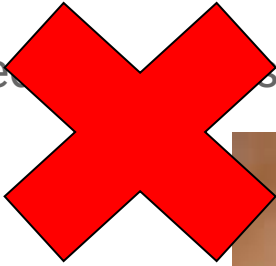


Bed bug myths

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vs



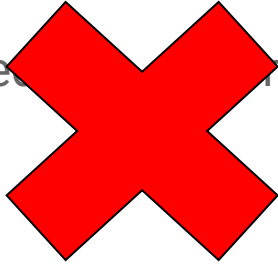
- Truth: bed bugs have never been demonstrated to transmit any human pathogens

Bed bug myths

- Bed bugs are microscopic

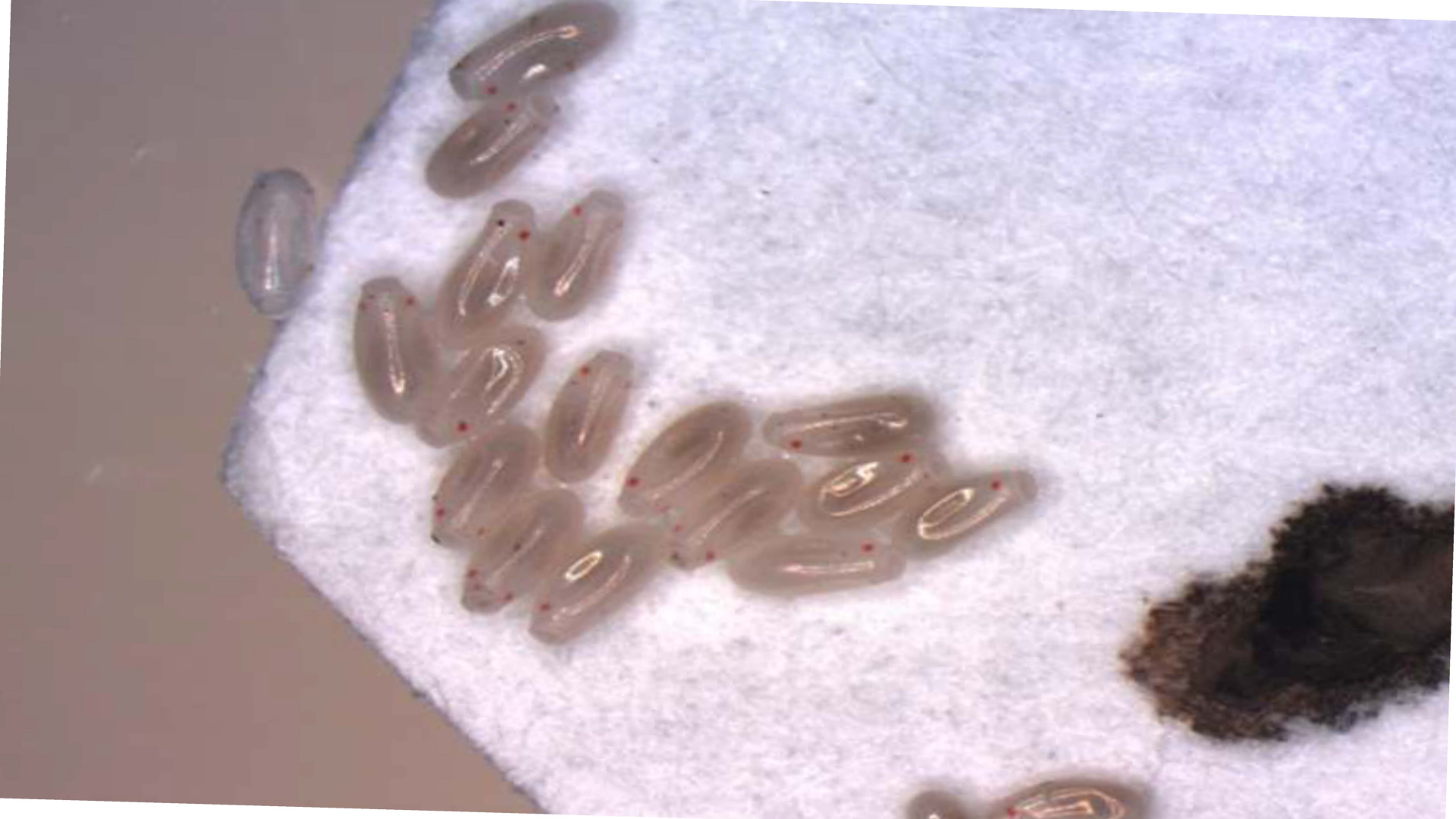
Bed bug myths

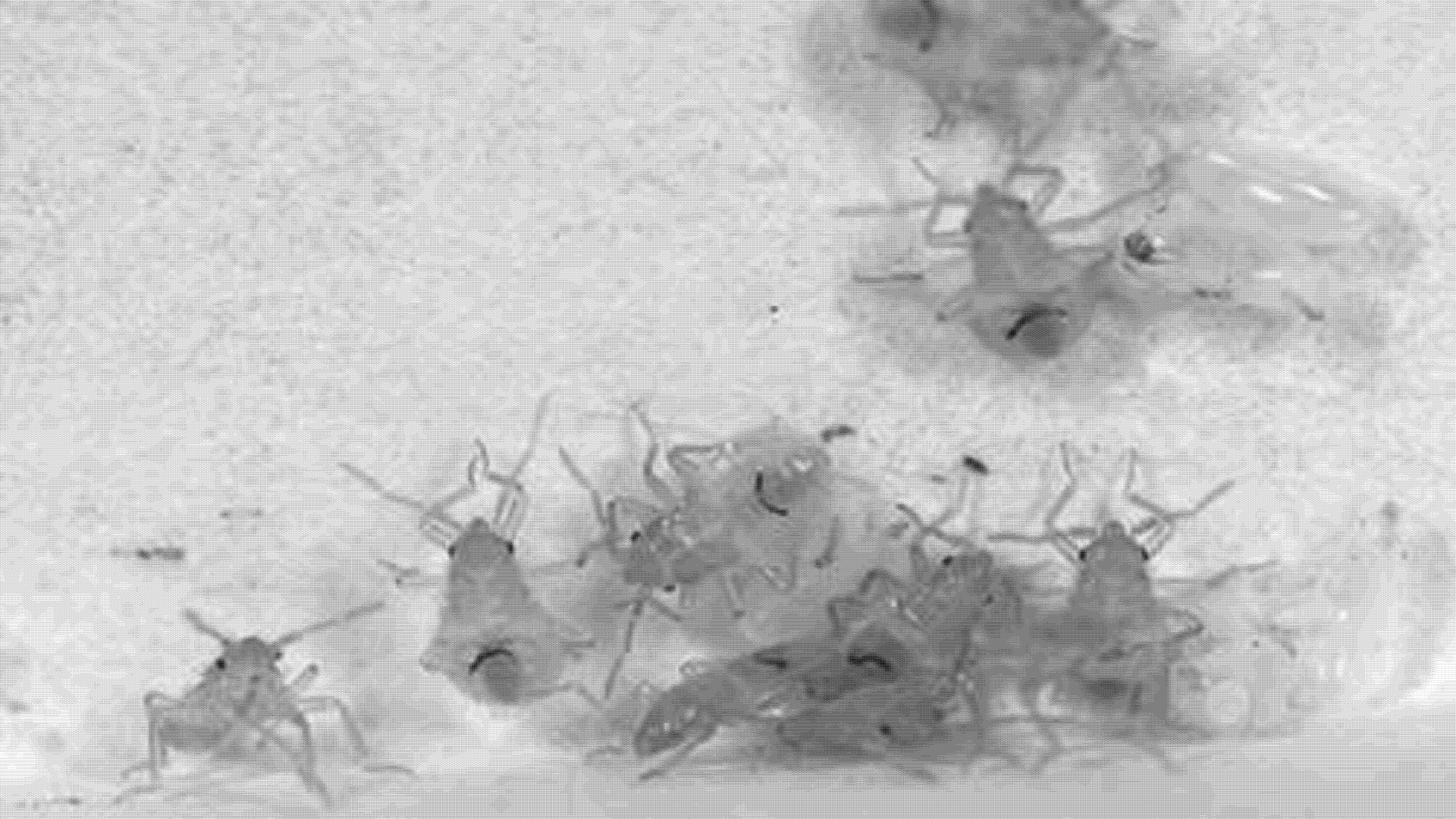
- Bed bugs are microscopic



- Truth: bed bugs can be seen by the unaided eye during all life stages











Bed bug ecology

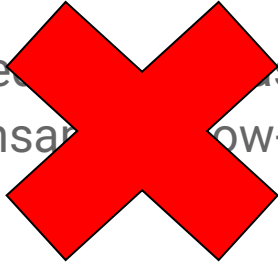
- nest parasites (require harborage)
- feed while host is inactive (usually night)
- development requires regular blood meals
- can survive months without feeding

Bed bug myths

- Bed bugs are associated with unsanitary, low-class environments

Bed bug myths

- Bed bugs are associated with unsanitary low-class environments



- Truth: bed bugs can be found in very clean, very expensive hotels and homes

Bed bugs require only a host and a harborage to become established

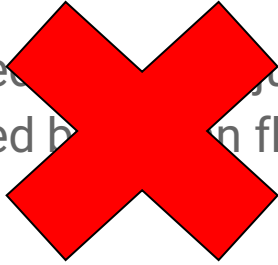


Bed bug myths

- bed bugs can jump
- bed bugs can fly

Bed bug myths

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- truth: bed bugs must crawl to travel between host and harborage (or be transported)

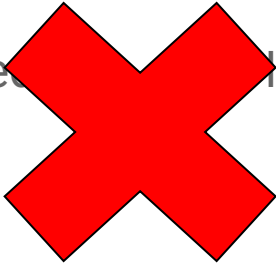


Bed bug myths

- Bed bugs only live in, on, or around beds!

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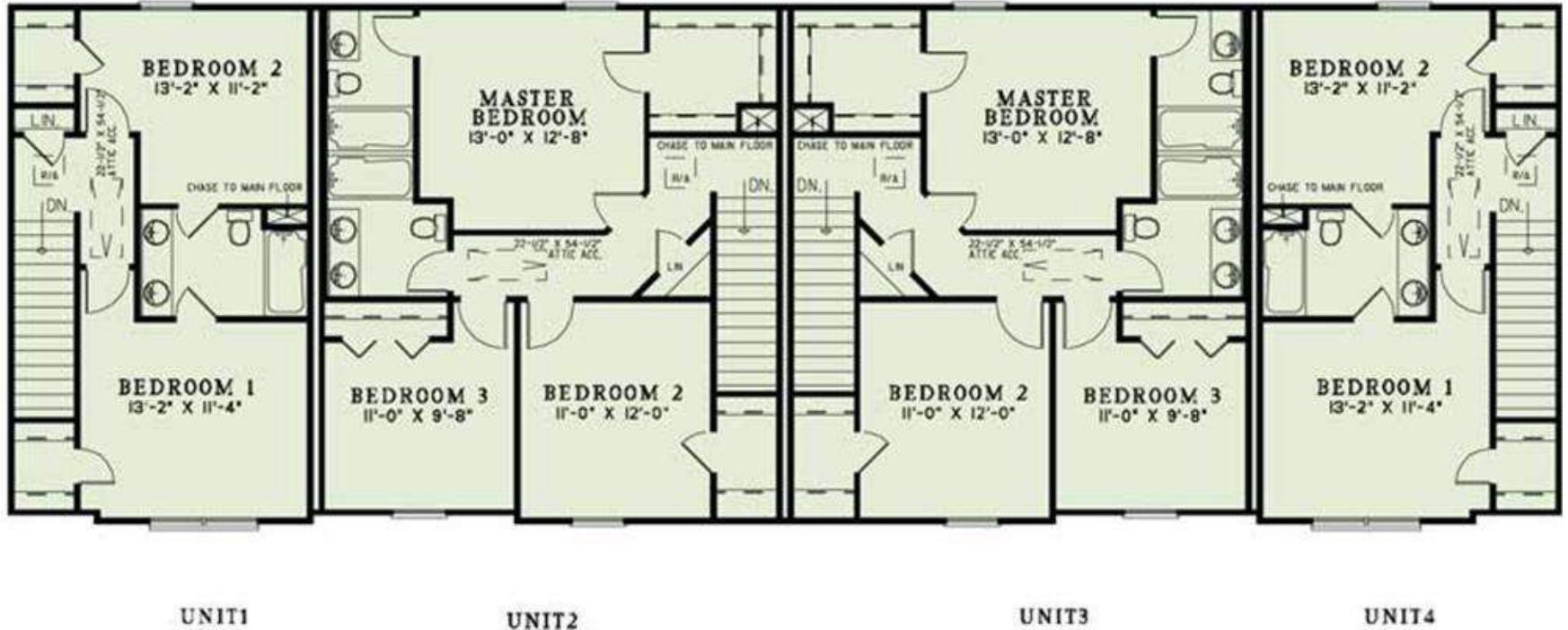
- Truth: bed bugs can live near any area where people sleep or rest.







Structural continuity



Blood meal required
prior to molting,
egg-laying



Prevention (of introduction)

- Education and communication
- Traveling precautions
- Second-hand furniture
- Infested personal items



Prevention (of establishment)

- Elimination of harborage sites
- Encasements / barriers
- Appropriate sanitation and maintenance



Consideration of 'clutter'

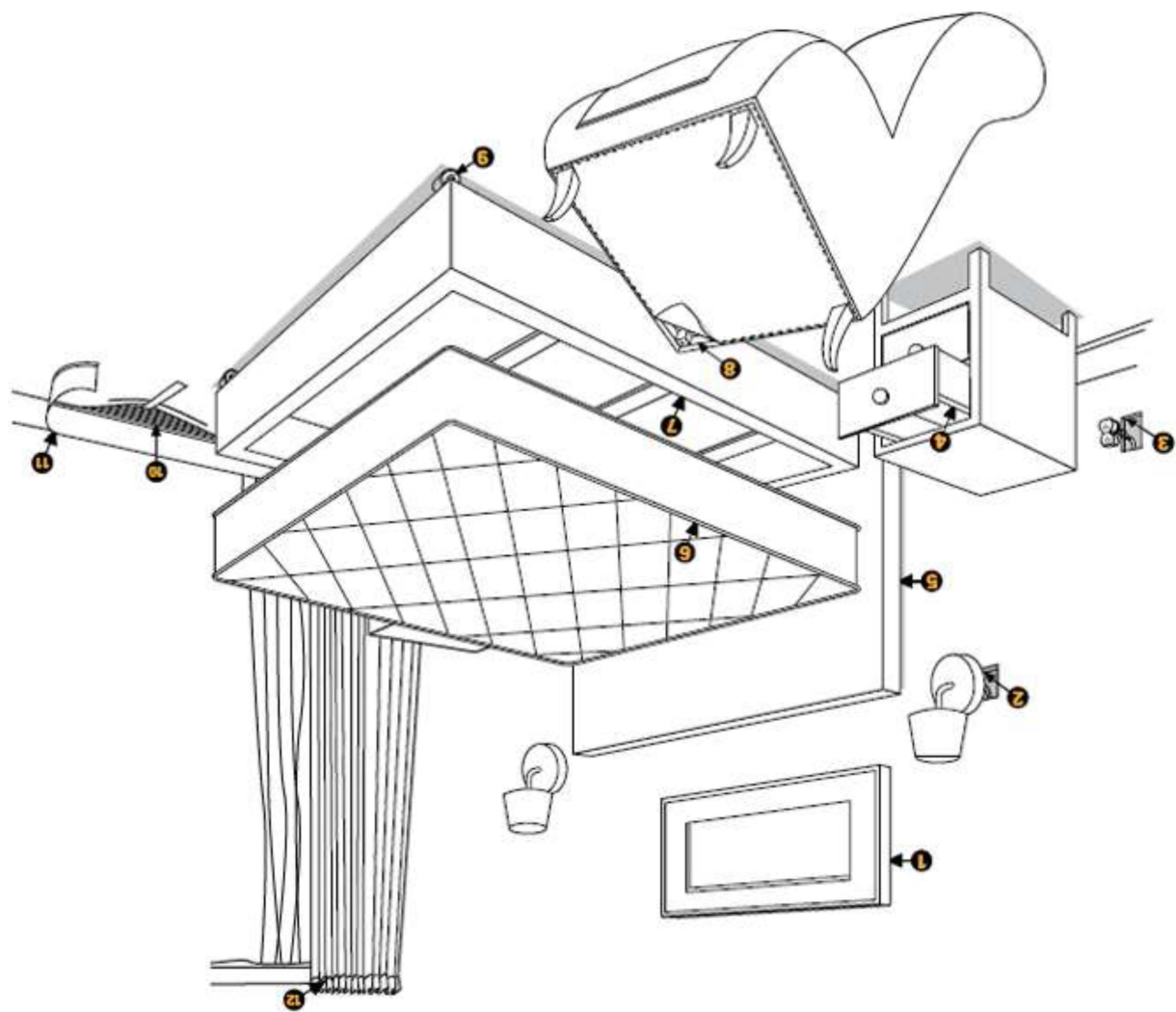


Monitoring for bed bugs

- **Visual / manual inspection**
 - Bugs, eggs, exuviae, fecal spots, blood smears / spots
- **Bed bug monitors**
- **Canine detection**





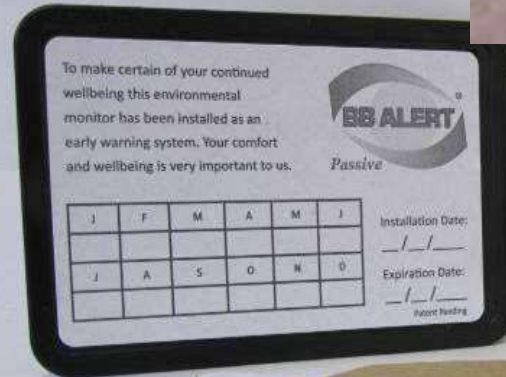


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Iwan Choe, Dept. of Entomology, UC Riverside
by permission



Bed bug myths

- All furniture and other items infested with bed bugs need to be thrown out.

Bed bug myths

- All ~~infested~~ and other items infested with bed bugs need to be thrown away.

- Truth: infested items can usually be treated or contained; only very large (100+ bugs) infestations should be thrown away.



Bed bug management: nonchemical tactics

- Disposal of infested items (clearly marked)
- Clutter management
- Barriers (encasements, interceptors)
- Laundering (heat is most important)
- Vacuum (provide HEPA filter)
- Steam
- Heat (> 45oC or > 115oF, 2 – 4 hours min.)
- Cold (below freezing, 3 days min.)



Bed bug management: desiccation

- Desiccants break down waxy cuticle of insect, insect dies due to water loss
- Diatomaceous earth (DE)
- Silica
- Limestone

**Must remain dry to retain efficacy,
have potential to remain active for long
period of time...**



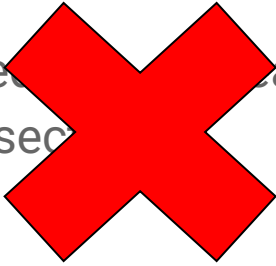
Bed bug myths

- Bed bugs are easily managed with insecticides.



Bed bug myths

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Truth:

- Insecticides can be hazardous
- Insecticides can be ineffective
- Bed bugs are resistant to some insecticides
- There is no 'silver bullet'!

Bed bug management: chemical tactics

- **Liquids**
 - Contact sprays, aerosols
 - Residual sprays (professional products)
- **Solids (powder, dusts)**
- **Fumigation**



Consider insecticides carefully

- **READ LABELS (pest + site)!**
- **Bed bug insecticides**
 - Not labeled for application to people!
 - Rarely labeled for application to bedclothes, mattresses!
- **So where do we apply them?**
 - Directly to bugs, harborage areas (contact)
 - Somewhere between harborage and host (residual)

Summary: bed bug prevention and management

- Bed bugs are very common!
- Bed bugs are blood-sucking nest parasites
- Bed bugs cannot be identified from “bites”
- Bed bugs spread easily within communities
- Bed bug management requires good communication
- Bed bug management can be difficult and costly

<https://stopbedbugs.org/>



STOP BED BUGS

Home

About

Resources/Recursos

Training



How To Stop Bed Bugs:

Learn Your Rights and Responsibilities

In this course you will learn how to spot bed bugs, how to keep them out of your home and how to report them to your landlord.

START





HOME

SEARCH

ON THIS SITE

What is IPM?

Home & landscape pests

Agricultural pests

Natural vertebrate pests

Exotic & invasive pests

Wood gallery

Natural enemies gallery

Weather, models & degree-days

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MAKE A GIFT

UC IPM Home > Homes, Gardens, Landscapes, and Turf > Bed Bug

How to Manage Pests

Pests of Homes, Structures, People, and Pets

Bed Bugs

Revised 5/13

In This Guideline:

- Identification and life cycle
- Damage
- Management

- About Pest Notes
- Publications
- Glossary

Related videos

- Don't bring bed bugs home when you travel (2:40)
- How to inspect for bed bugs (2:28)
- How to use a bed bug detector (2:38)

Bed bugs are blood-sucking insects in the family Cimicidae. Both nymphs and adults feed on sleeping or sedentary humans, mostly at night, a time when this pest's stealthy habits are difficult to observe.

Bed bugs are found worldwide in association with human habitations. The common bed bug, *Cimex lectularius*, is a widely distributed species most frequently found in the northern temperate climates of North America, Europe, and Central Asia. It occurs more sporadically in southern temperate regions. In tropical regions *C. hemipterus*, the tropical bed bug, is the dominant species. The most common species found in California is *C. lectularius*.

The growth and development of *C. lectularius* is optimal when it feeds on humans; however, this insect also feeds on other species of mammals and on birds found near the home including chickens, mice, rats, and rabbits. Bed bugs and swallow bugs, close relatives of bed bugs, may also be found in and around human dwellings and may sometimes bite humans, although their preferred hosts are bats and birds, respectively.

Until recently, bed bug infestations were thought to be associated primarily with crowded and dilapidated housing. However, bed bugs have undergone a resurgence in pest status and can now be found even in the finest hotel and living accommodations. The reasons for this resurgence aren't totally understood but appear to involve increased global travel and commerce, ease of movement of infested items, widespread insecticide resistance, and changes in pesticides available to control this pest.

IDENTIFICATION AND LIFE CYCLE

Adult bed bugs are oval, wingless, about 1/5 inch long, and rusty red or mahogany. Their bodies are flattened; they have well-developed antennae, their compound eyes are small, and the area behind the head (the pronotum) expands forward on either side of the head, bearing many small hairs. The immature, called nymphs, appear identical to the adults except for their smaller size (1/20 - 1/5 inch), triceron anal skeleton (sclerite), and lighter yellowish-white color.

Bed bugs are readily distinguished from another common blood-sucking species, common house bugs (also known as kissing bugs), by their smaller size, more rounded shape, and lack of wings as adults. Common house bugs may be up to 3/4 inch long. (See Pest Notes: [Common House Bug](#).)

Bed bugs can be distinguished from their close relatives bat bugs and swallow bugs by comparing the length of the hairs on the pronotum to the diameter of the eye; this requires a hand lens or microscope. These hairs are shorter than the diameter of the eye on a bed bug and longer than the diameter of the eye on bat bugs and swallow bugs. This distinction is sometimes important to make, since managing these bed bug relatives involves managing their vertebrate hosts (i.e., bats and swallows) nesting in, on, or near homes.

Female bed bugs lay 200 to 900 tiny (1/20 inch) white eggs during their lifetime, usually two to five eggs per day, on rough surfaces such as wood or paper near their hosts' sleeping places, resting places, or both. Glue-like material covers the eggs, which hatch in about 10 to 15 days at room temperature. After hatching occurs, the eggs hatch frequently remain stuck in place.

There are five progressively larger nymphal stages, each requiring at least one blood meal before molting to the next stage. The entire life cycle from egg to adult requires anywhere from five weeks to four months, depending on temperature and availability of food (blood). Development occurs most rapidly when temperatures are between 70° and 62° F.

Both nymphs and adults generally feed at night and hide in dark cracks and crevices during the day, although hungry bugs may feed and bite hosts on nearby and sedentary. Common hiding places are typically located within 6 or fewer feet from areas where humans sleep or rest and include: along mattress seams and tufts; beneath covers; in wall joints of box springs; in cracks and joints of bed frames; behind baseboards and headboards; under loose wallpaper; behind picture frames; and inside furniture, appliances, electronics and upholstery. Bed bugs are more likely to harbor in or on materials made of wood, paper, or fabric as compared to those made of metal or plastic.

Occasionally, people may pick up bed bugs in theaters or on buses and trains. People can also bring bed bugs into their home on infested clothing, bedding, furniture, and luggage.

Bed bugs can go without feeding for 20 to 400 days, depending on temperature and humidity. Older stages of nymphs can survive longer without feeding than younger ones, and adults have survived without food for more than 400 days in the laboratory at low temperatures. Adults may live up to one year or more, and there can be up to four successive generations per year.

DAMAGE

Bed bugs feed on humans, usually at night when they are resting. This insect feeds by pricking the skin with its elongated mouthpart, which consists of four stylets that normally fold under its body when at rest but fully extend during blood feeding. Two maxillary stylets form



Bed bugs adults and nymphs. Scale bar represents 5 millimeters.



Bed bug eggs on paper. Eggshells are visible as red dots on the surrounding bed bug nymphs.



Bed bug on a human arm.

http://www.youtube.com/watch?v=H9d_EB6XFUc



You Tube

≡ GUIDE



Thanks!...questions?

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