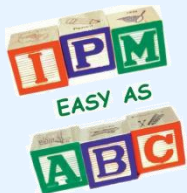




Bed Bugs in Sensitive Environments

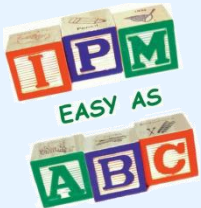
Nebraska Extension



Since 2000, bed bugs have become a problem in the U.S. and other countries

Why?

- ❖ Infestations are not identified early when easiest to control
- ❖ Today's bed bugs are resistant to insecticides
- ❖ Established infestations are hard to treat and are expensive
- ❖ People travel more and move bed bugs from place to place



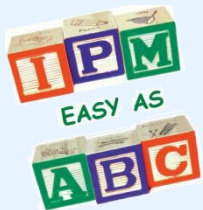
Low income families and individuals most at risk

- ❖ High density housing
 - Apartment dwellers
 - Refugees/immigrants
 - Subsidized housing
- ❖ Homeless shelters and halfway houses
- ❖ Elderly



Problem in high density housing is related to the cost of control

- ❖ Landlords and property managers may not be willing to pay for eradication
 - Monthly sprays will not control bed bugs or prevent them from getting into units
- ❖ OTC products are pyrethroids and do not work very well
- ❖ Some families are living with bed bugs and cannot afford treatments



Good housekeeping/cleanliness will not prevent bed bugs

- ❖ But, clutter provides bed bug harborage
 - More hiding places means more bed bugs
- ❖ Clutter may also prevent treatments from being effective



Photo: University of Nebraska–Lincoln

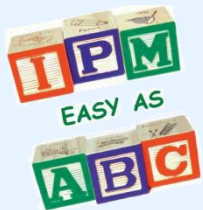


Bed bugs are blood feeders

- ❖ Adults are $\frac{1}{4}$ -inch long
- ❖ Scab colored
- ❖ Flat, unless they have recently fed
- ❖ Prefer human blood, but will also feed on pets

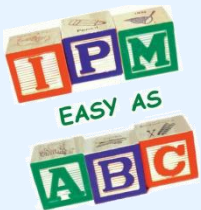


Photo: Nebraska Extension in Lancaster County



Hungry bugs most active at night

- ❖ Activity period usually begins after people go to bed
 - Exhaled CO_2 triggers activity
 - Bed bugs sense and track body heat
 - Detect human smell
 - ✓ Bed bugs may hang out in dirty clothes/hampers
- ❖ Early morning, bed bugs return to hiding places

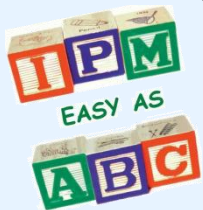


Developmental time (life cycle) is food and temperature dependent

- ❖ Females lay tiny eggs
 - Hatch in ~ 1 week
- ❖ Each stage must feed on blood to develop
 - Note that even after feeding, first instar is hard to see
- ❖ After feeding, it rests about a week between feedings:
 - Digest blood and molt



Egg → nymph → adult → egg = ~ 5-6 weeks



Bed bug signs: look for tarry, black fecal spots near sleeping areas



Photo: Nebraska Extension in Lancaster County

Edge of mattress



Photo: Nebraska Extension in Lancaster County

Inside box springs



Signs of a bad infestation on a mattress



Photo: University of
Nebraska–Lincoln

Ticking of box springs

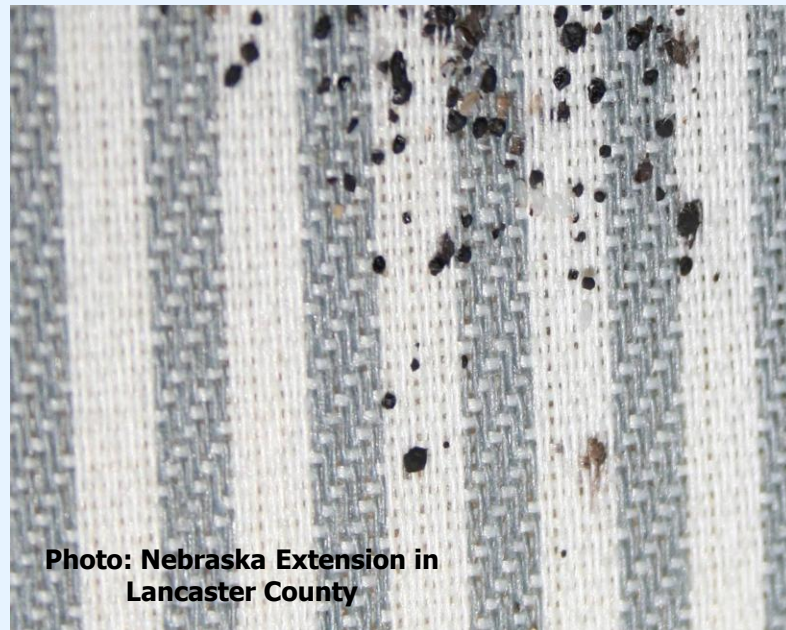
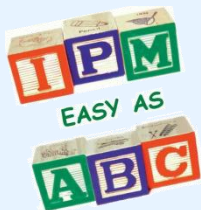


Photo: Nebraska Extension in
Lancaster County



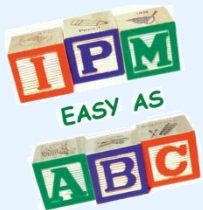
Bed bugs may be found in other areas of the house, too...

❖ Possibly hiding places may include:

- Curtains
- Door hinges
- Behind picture frames
- Baseboard cracks and crevices

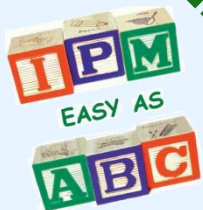


Curtains



About 25% of U.S. population does not react to bed bug bites

- ❖ Some children may not react (immune system not fully developed)
- ❖ Age 12-65: ~25% do not react to bite
- ❖ Elderly (65 + yrs): 42% don't react
- ❖ The bite may or may not be itchy
 - **Welt or no welt**
- ❖ Bed bugs feed on exposed skin at night
 - **Bed bugs don't crawl under or bite through clothing**
- ❖ Bites may lined up in a row, singly or more random



Bite reactions are variable

- ❖ Red spots that don't itch
- ❖ Inflamed itchy bites
- ❖ Rash
- ❖ Blisters
- ❖ Hives



Inflamed, itchy bites



Good news: bed bugs don't transmit diseases

- ❖ Secondary infections
- ❖ Asthma (unlikely, but reported)
- ❖ Psychological issues
 - Insomnia
 - Anxiety
 - Stress
 - Emotional distress



Photo: Nebraska Extension in Lancaster County



Infestation vs. Introduction

❖ "Infestation"--where people sleep nearly every night or regularly

- Box springs, mattress, and other places near where people sleep
- Sofas and upholstered furniture



With unlimited food → bed bugs increase



Infestation vs. Introduction

- ❖ “Introduction”—bugs left by a person, often living in an infested place
 - Students coming to school
 - Adults going to work
 - If bugs can't feed, infestation can't start
 - ✓ Bugs may eventually die or could crawl onto someone's clothing or backpack
 - Introduction locations:
 - ✓ Schools, work places, doctor's offices, and other places where people spend time
 - ✓ An infestation usually begins with an introduction
 - ❖ One mated, female bug in a home or apartment is all that's needed



How do bed bugs get in schools, daycares, or other sensitive environments?

- ❖ From people carrying bugs on their clothing or in other items (backpacks, books)

- Could end up in lockers, coat racks, under desks
- Individual bugs, not breeding populations

- ❖ Employees (with infestations at home) bring them to work



Possible actions....

- ❖ Bag or put students personal belongings, clothing, purses, backpacks in plastic tote
- ❖ Isolate outerwear from that of others
- ❖ Social stigma with bed bugs so confidentiality is important



Heat and cold temps kill bed bugs

- ❖ Heat: 120° F (short time)

- ❖ Cold: 0° for 4 days

So...laundrying washable items can be helpful

- ❖ Wash with detergent in hot water (140° F) AND/OR

- ❖ Dry in a medium-hot dryer for 30 minutes



Canine detection

- ❖ Dogs can be specially trained to detect bed bugs
- ❖ Locate single bugs or infestations
- ❖ "Hits" should always be verified by handler or a pest control technician



Preventing Bed Bugs at Home

❖ Be careful where you sleep

- Inspect beds when you travel
- Behind headboard
 - ✓ Remove from wall
- Remove bedding, look for fecal spots
- Don't put luggage/computer cases or purses on the floor



Preventing Bed Bugs at Home



Photo: University of
Nebraska–Lincoln

❖ Once at home:

- Inspect clothing, toiletries or luggage before coming inside
- Or, place clothing in plastic bags
 - ✓ Immediately launder or dry (30 minutes)
- Use duffel bags (can be placed in a dryer)

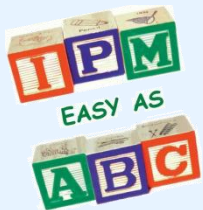


Avoid used furniture, even if it looks good



Be aware of visitors in your home

- ❖ Recent travelers
- ❖ Apartment dwellers or those who live in group homes
- College kids



Treatments

- ❖ Bed bugs are resistant to over-the-counter liquid treatments
 - Foggers do not work
- ❖ Recommend working with an experienced professional
 - Professional-use insecticides more effective than OTC
 - Professionals have proper application equipment
 - Professionals licensed to apply them safely
 - Heat treatments, done carefully by professionals, can eradicate bed bugs



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