DEALING WITH BED BUGS

EXTENSION
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REASON FOR THE RESURGENCE

Why?

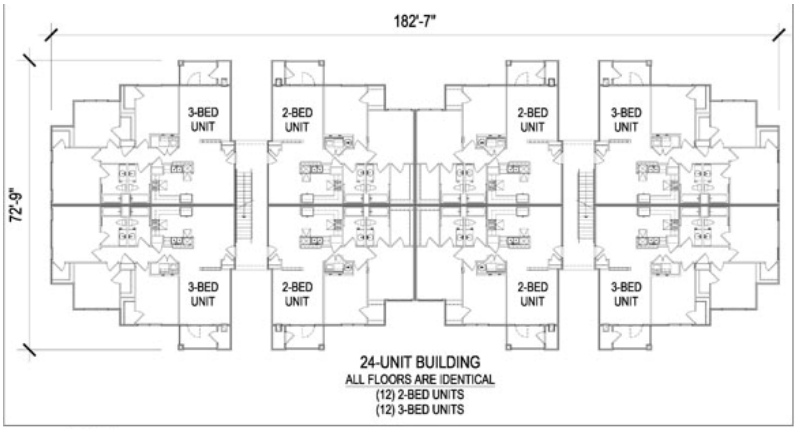
- Increase in speed and extent of travel
- Changes in pest control practices
- Lack of awareness or reaction
- Cost of treatment
- Insecticide resistance


Photo: J. Green, Nebraska Extension in Lancaster County

HIGH RISK GROUPS

- High density housing where people sleep, and come and go
  - ➢Apartments, dorms, cabins
  - ➢Refugees/immigrants
  - ➢Nursing homes, residential care
  - ➢Homeless shelters, hostel
  - ➢Hotels, motels, resorts
  - ➢Child care facilities

CHALLENGES FOR PROPERTY MANAGERS



High density housing

Movement from unit to unit

Social dynamics

Cooperation

HUMAN BED BUG

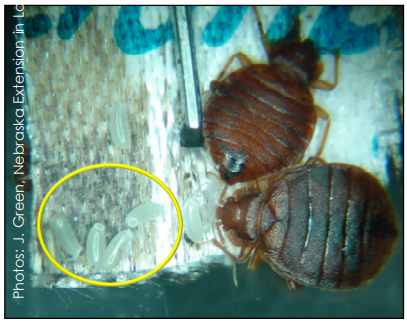
- Blood-feeding insect
- Order: Hemiptera/Heteroptera
- Latin for "bug" and "bed"
- Humans are primary host

Cimex lectularius

BED BUG IDENTIFICATION

- Adults 1/4 inch (5mm) long
- No wings
- Oval shape
- Dorsoventrally compressed
- reddish-brown, mahogany
- Appear different based on age and feeding status

EGG LAYING CAPABILITIES

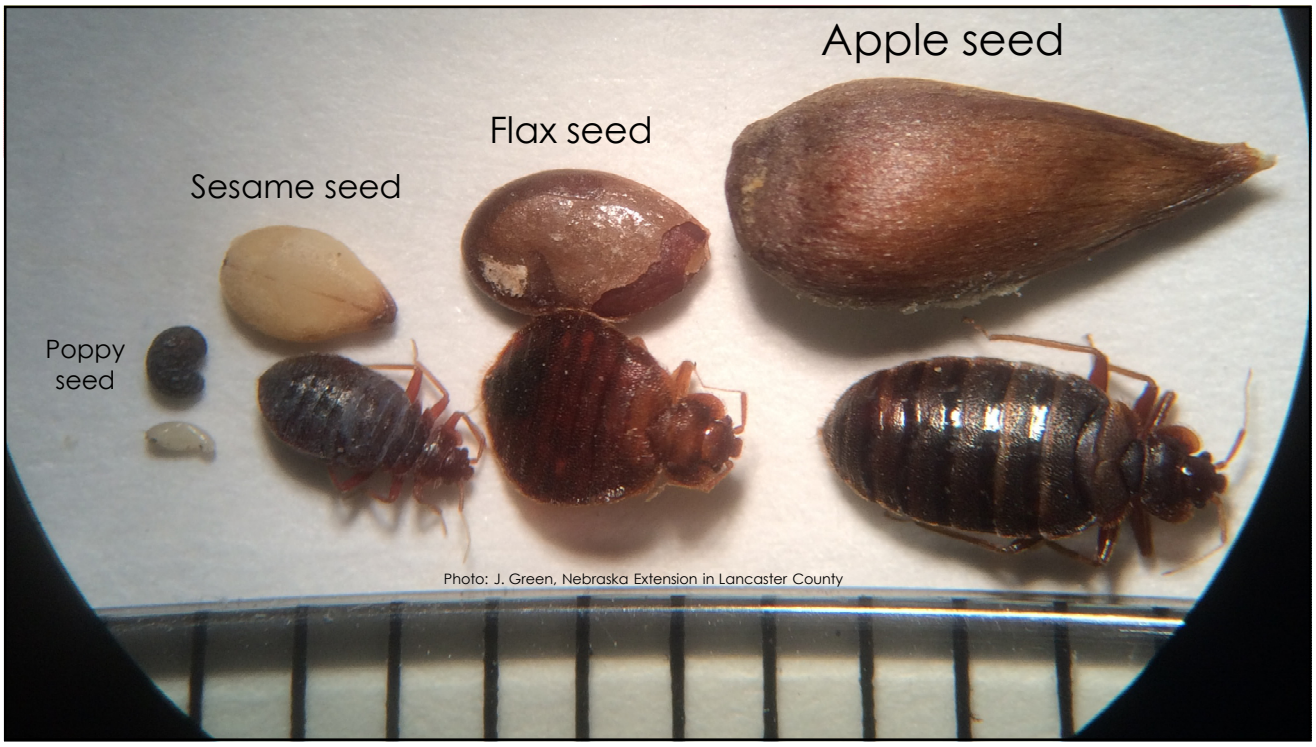


- Female lays eggs individually
- Glued to surfaces
- Hatch between 7-12 days
- 200-500 eggs in lifespan
- Incomplete metamorphosis
- Egg to nymph to adult in 5-6 weeks

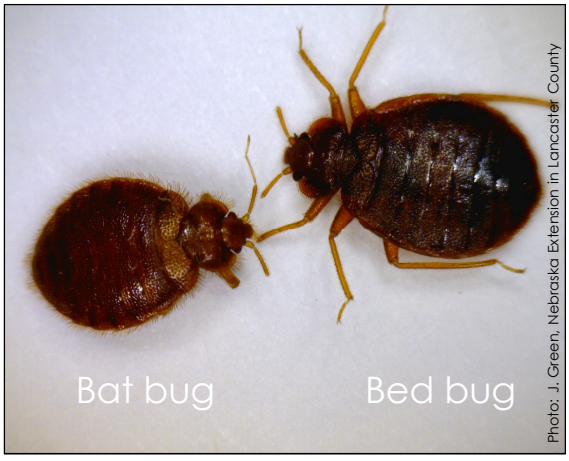
RATE OF GROWTH AND DEVELOPMENT

- Depends on food
- Depends on temperature
- 3-4 generations per year
- Lifespan 6-12 months
- Optimal conditions:
  - 70°F - 90°F
  - life cycle 1 month

Apple seed comparison



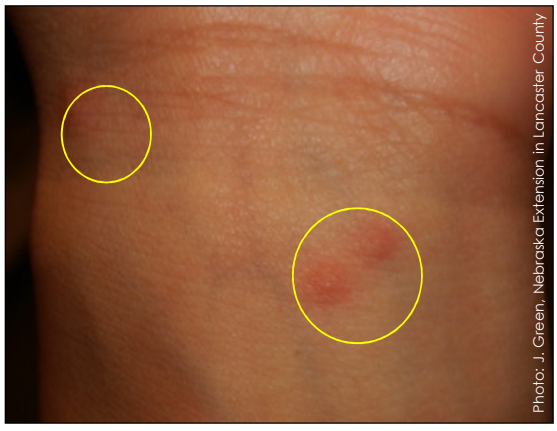
BED BUGS EVOLVED FROM BAT BUGS



ENGORGED BED BUGS

BLOOD FEEDING BEHAVIOR

- Adults feed every 3-5 days
- Exposed skin
- Inject compounds
- Reaction of host
  - ➢Itchy, red bumps
  - ➢Some individuals do not react
- Do not transmit diseases



OTHER IMPACTS OF BED BUGS

Psychological	Social	Economical
• Delusions • Anxiety • Depression • Stress • Obsessive • Loss of sleep	• Stigma • Negative perceptions • Reduced self-esteem • Social isolation	• Discarded furniture • Eradication efforts • Treatment products

POST MEAL BEHAVIOR: REST AND DIGEST

- After blood meal
  - ➢Rests up to a week
  - ➢Digests blood
  - ➢Molts or lays eggs

ADULTS AND NYMPHS LIVE TOGETHER

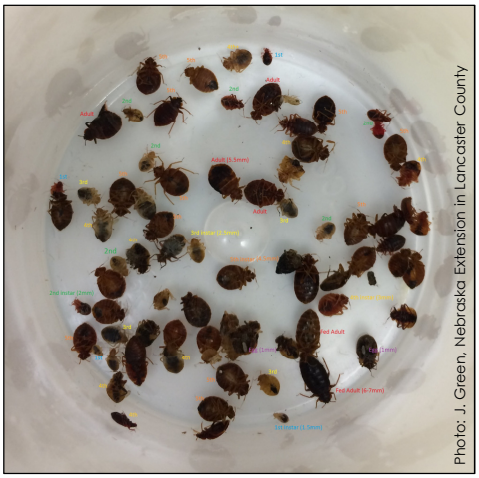


Photo: J. Green, Nebraska Extension in Lancaster County

- Emit strong odor
- Harborage contains:
  - Fecal stains
  - Eggs
  - Shed exoskeletons or skins
  - Live bugs
- They are expert hitchhikers

Infestation

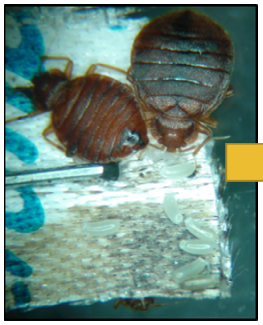
- Where people sleep nearly every night or regularly
- Unlimited food, populations can increase rapidly

Introduction

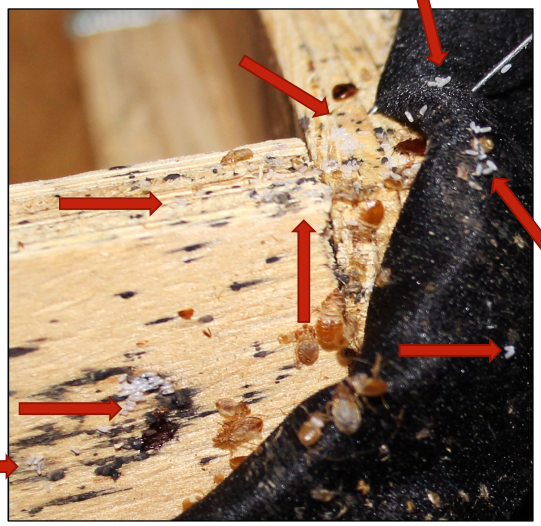
- An individual bed bug "dropped" by a person who spends time in an infested place
- Cannot feed, cannot multiply

Photos: J. Green, Nebraska Extension in Lancaster County

HOW DO THEY MULTIPLY?

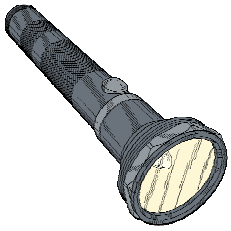


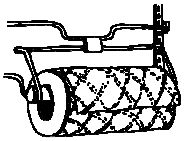
Bed bug eggs



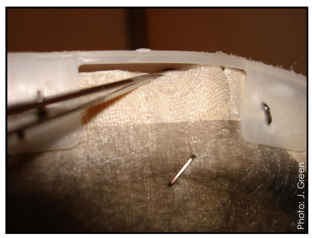
Photos: J. Green, Nebraska Extension in Lancaster County

INSPECTION TOOLS





CHECK BED AND SURROUNDING AREAS



SEEING THE SIGNS

Fecal spots, shed skins, blood stains, crushed bugs, live bugs, eggs

CANINE DETECTION

- Live bed bugs and viable eggs
- Good for largescale inspections when speed is required
- "Hits" verified by handler
- Location of bugs, airflow and temperature can alter results
- Not perfect - May fail to find infestation or indicate a false positive

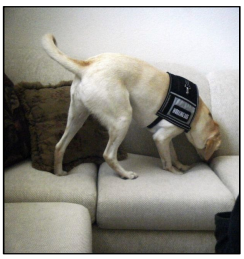
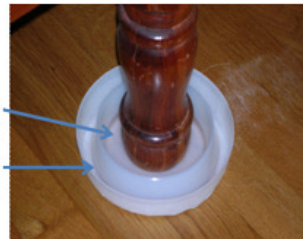


Photo: Nebraska Extension in Lancaster County

BED BUG MONITORS

CLIMBUP® INSECT INTERCEPTOR



- Devices that are left in room
- Aid in early detection
- Evaluate the effectiveness of treatment
- Intercept bed bugs like a moat
- Humans act as the lure

*For vacant units: Use monitor with cup of dry ice (CO_2 attractant) to monitor room or evaluate treatment.

TEMPERATURE: TURN UP THE HEAT

- Cold: 0°F for 4 days
- **Heat: >120°F for 30 min**

- If you can't do a wash and dry, then choose to dry

Photo: J. Green, Nebraska Extension in Lancaster County

Most home dryers: ~120-155°F

COMMERCIAL HEATING EQUIPMENT

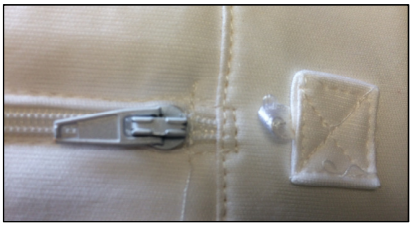
Heat: Portable electric or propane forced-air heaters deliver high volumes of heat, placed in targeted area.

Airflow: Portable fans that can withstand high temperature distribute the heated air evenly throughout the space and target high infestation zones.

Monitoring: Probes and sensors are used to track the heating progress and to ensure proper heat penetration in all places where bugs can take refuge.

MATTRESS MANAGEMENT

- Zippered encasement
- Protects both old and new mattresses
- Not preventative
- Easier to inspect
- Quicker to detect



REGULAR SANITATION

- Periodic inspections
- Do not throw away mattresses!
- Treat and/or clean items
- Store in air tight containers and bags
- Use lint roller
- Laundry (especially drying items)
- Vacuum management
- Trash & furniture disposal

HOUSEKEEPING AND CLEANLINESS

Bed bugs do not discriminate based on

However, clutter

- Increases harborage areas
- Makes inspection and monitoring more challenging
- Contributes to ineffective treatments

ROLE OF PEST MANAGEMENT PROFESSIONAL

- Plan to inspect and treat vacant units
- Verification of bed bug infestation
- Regular inspection and monitoring
- Inspection of adjacent units
- Provide guidelines on preparation

Chemical Treatment

- You must help technician
  - Prepare treatment area
  - Bag and launder items
- Takes several applications
- Risk of pesticide exposure to people and pets
- Areas can be missed
- Follow up treatments are common
- Must treat adjoining rooms or areas
- Bed bugs may be resistant to chemicals

Heat Treatment

- No chemical exposure
- May not need to launder items
- May be more expensive
- Fast acting
- No residual control
- Can be done poorly if equipment isn't good
- No resistance to heat
- All life stages are susceptible
- Single treatment will eliminate infestation

PREVENTING INFESTATIONS

- No bags or purses on the floor or bed
- Don't pile outerwear
- See-thru resealable bags
- Clear plastic totes
- Washable laundry bag
- Luggage storage
- Communicate and educate others
- Inspect, wash and dry used clothes, books, furniture