


TEXAS A&M
AGRI LIFE
EXTENSION


INTRO TO BED BUGS IN MULTI-FAMILY HOUSING

Michael Merchant, PhD, BCE
Texas A&M AgriLife Extension Service
m-merchant@tamu.edu



MYTHS ABOUT BED BUGS

**Bed bugs are
too small to see**



RECOGNIZING BED BUGS

- 4-5 mm-long (size of apple seed),
- mahogany-colored, wingless, flattened
- Dark fecal specks on mattresses, box springs and other hiding places




MYTHS ABOUT BED BUGS

**Bed bugs weren't a
problem until
they were
brought from**




A LITTLE HISTORY... BED BUGS IN WWII

START FROM *Scratch!*
EXAMINE YOUR BUNK AND IMMEDIATE AREA FOR BEDBUGS

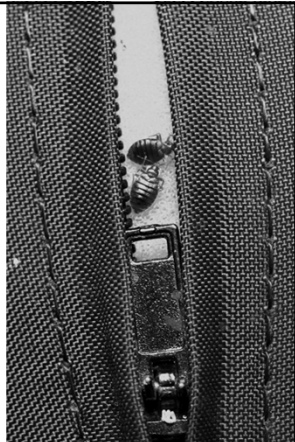


***BE ESPECIALLY WATCHFUL AT NIGHT* AND
ALLOW NONE TO PASS AT ANY TIME-DON'T
LET A BED BUG PUT THE *bite* ON YOU!
SEEK . SIGHT . AND DESTROY!**

WWII Army educational flier for soldiers

WHY CURRENT INFESTATION?

- Current resurgence likely due to multiple factors
 - Increased international travel
 - Loss of older, effective insecticides
 - Resistance to newer pesticides



PYRETHROIDS AND DDT

- Initially, bed bugs well controlled with DDT (1940s), but resistance seen within 8 years of its use
- Today, resistance well-documented and widespread to DDT, pyrethroid insecticides
- Pyrethroids remain primary control tool for bed bugs among pest management professionals

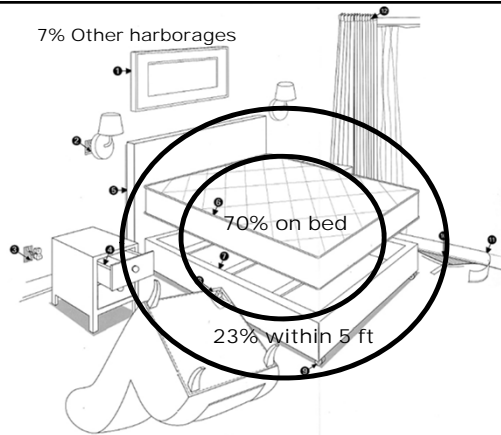


MYTHS ABOUT BED BUGS

You get rid of bed bugs by discarding infested mattresses



7% Other harborages




MYTHS ABOUT BED BUGS

You can get rid of bed bugs by setting off foggers (the more the better)




MYTHS ABOUT BED BUGS

It's best to wait until tenants complain




PEOPLE AND BED BUG BITES



- Prefer feeding during darkness
- Bites painless
- More than 50% of people in multifamily housing with bed bug infestations will not report a problem
- Perhaps 1 in 20 people react obviously to bed bug bites

MYTHS ABOUT BED BUGS

Dirty, messy people get bed bugs

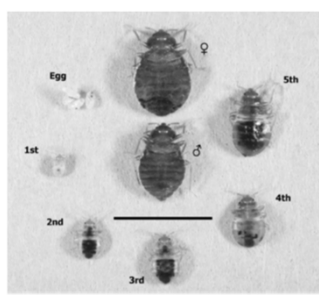


A LITTLE BED BUG BIOLOGY

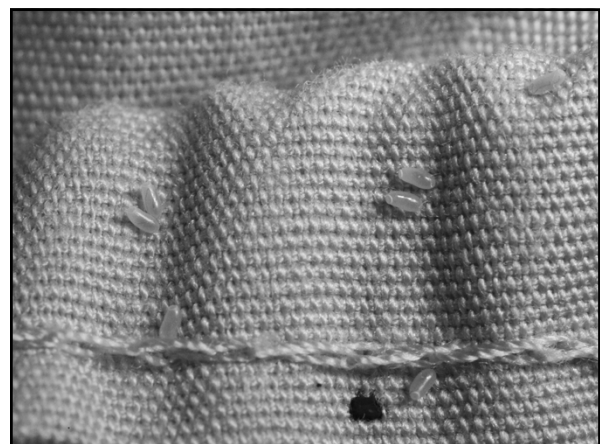


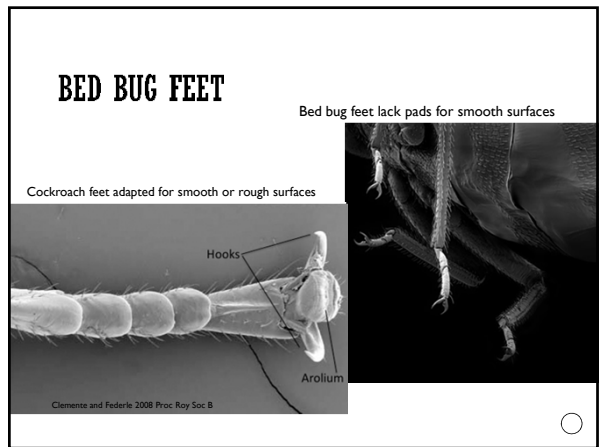
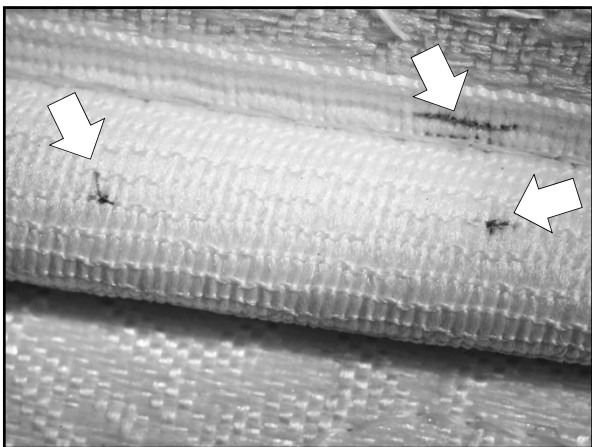
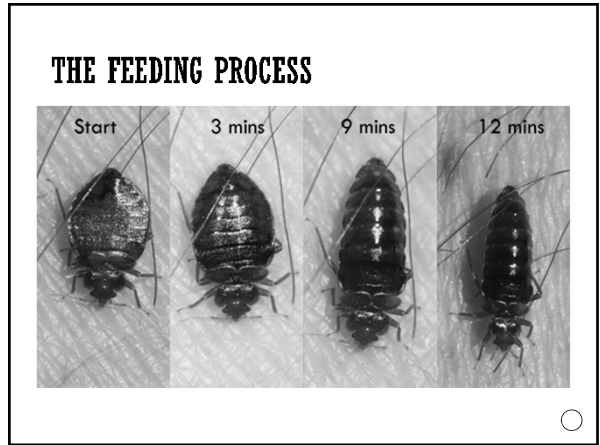
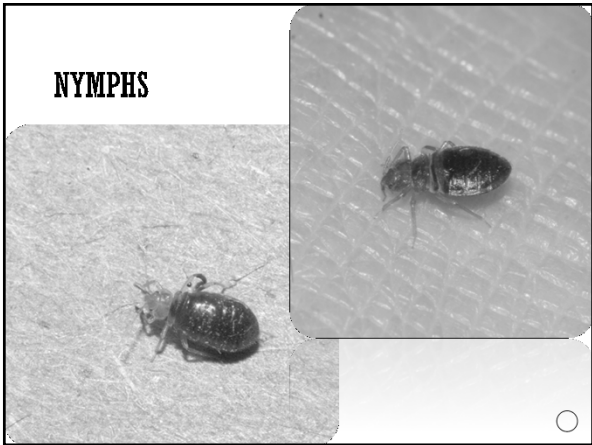
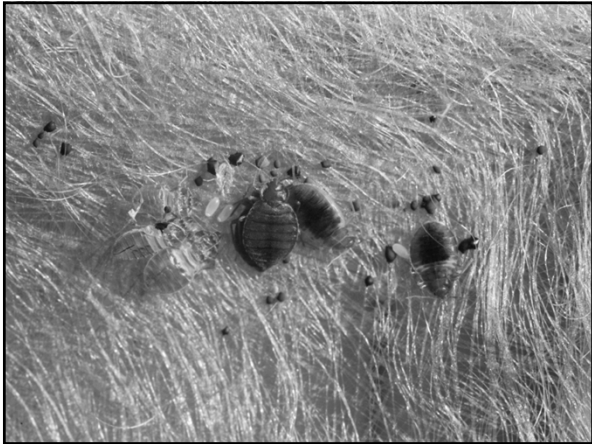
BED BUG LIFE CYCLE IN FIVES

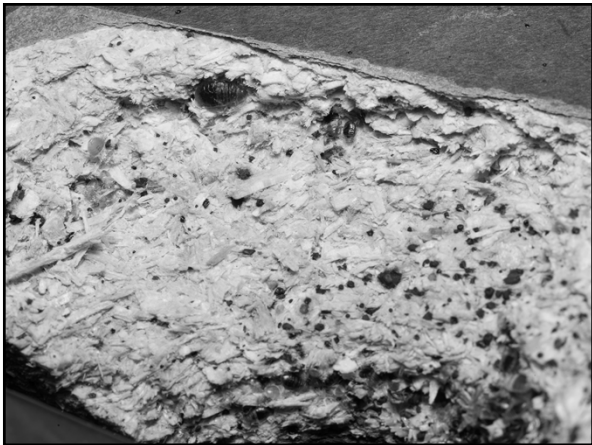
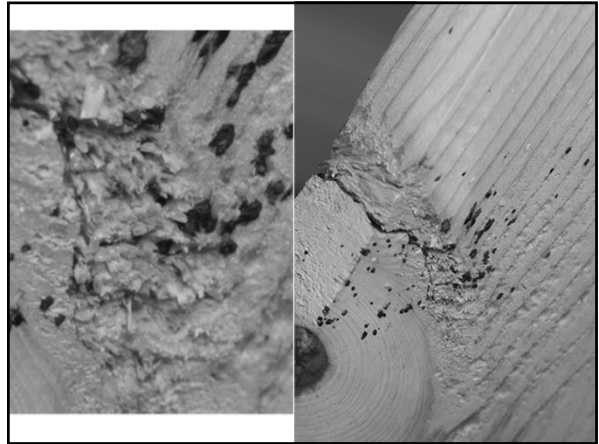
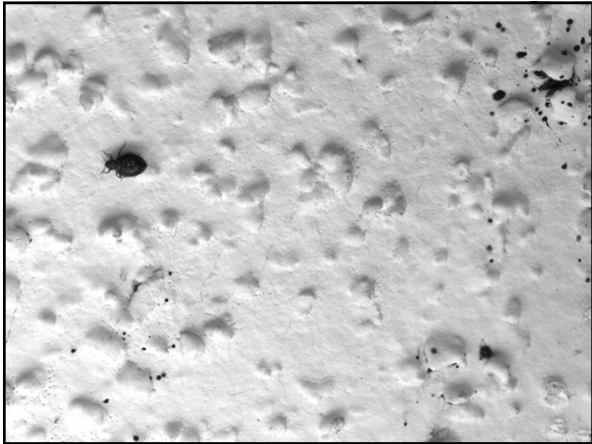
- Life cycle as short as 50 days
- Feed every 5-7 days
- Five nymphal life stages
- Females lay 3 to 5 eggs per day, typically 50-100 over lifetime.



From S. Doggett






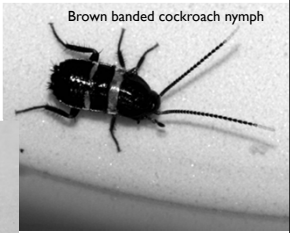



NOT BED BUGS

Dermestid beetle larva





Brown banded cockroach nymph

SOME FACTS ABOUT BED BUG BEHAVIOR

- Will feed in daytime if necessary
- May travel 20 feet from hiding place to feed...even farther if necessary
- Seem to prefer humans over pets
- Attracted to humans by body odor, body heat, carbon dioxide

AVOIDING BED BUGS DURING TRAVEL

- Avoid putting luggage on or next to bed
- Use luggage stand or ironing board
- Quarantine suitcase in garage if in doubt



FIGHTING BED BUGS AND WINNING



HIRE A PROFESSIONAL

- Licensed and trained to safely apply pesticides
- Knows how to locate and identify pests
- Experienced in what works and what doesn't



AND THEN THERE'S THE LAW (TOC)

- Sec. 1951.459. PEST CONTROL SERVICES FOR CERTAIN BUILDINGS. The owner of a building that is an apartment building, day-care center, hospital, nursing home, hotel, motel, lodge, warehouse, school, or food-processing establishment, other than a restaurant, retail food, or food service establishment, may obtain pest control services for that building from a person only by:
 - (1) contracting with a person who holds a license to perform the services; or
 - (2) requiring a person employed by the owner who is licensed as a certified noncommercial applicator or technician to perform the services.

Apartment
can't do bed
bug control
in-house
without a
license

PIECES OF A SUCCESSFUL BED BUG CONTROL PROGRAM



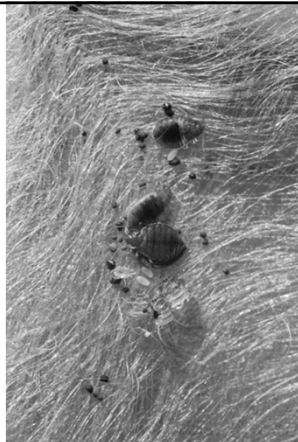
HAVE A MONITORING PLAN BEYOND TENANT REPORTING



EARLY DETECTION IS KEY

- Early infestations of bed bugs usually confined to bed or within 5 feet of bed
- Advanced infestations spread away from bed, spreading problem
- Advanced infestations will cost more to control

Small infestations of bed bugs stay together



DON'T RELY ON COMPLAINTS

- Some embarrassed to complain
- Many do not know signs
- Most people do not react to bites
 - In apartments less than half of infested units knew (or admitted they knew) they had bed bugs
 - Perhaps as few as 5% of individuals react strongly to bed bug bites



Bed bug bites on hand

CANINE INSPECTIONS

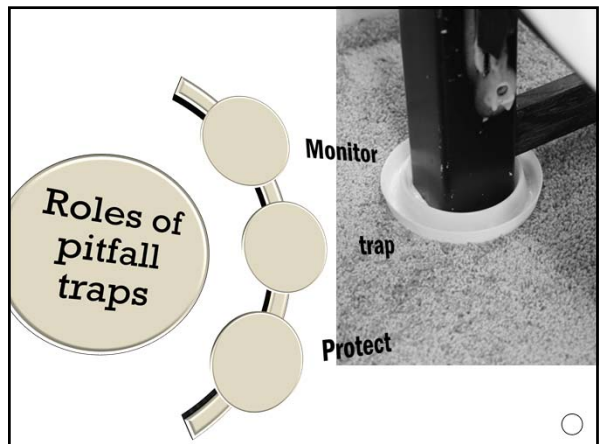
- Relatively fast, can detect low-level infestations
- Quality of inspection varies greatly
- Subject to false positives
- Can be expensive



PITFALL TRAPS: CLIMBUP INTERCEPTOR



PITFALL TRAPS: BLACKOUT INTERCEPTOR



ABBREVIATED INSPECTIONS OF ALL APARTMENTS

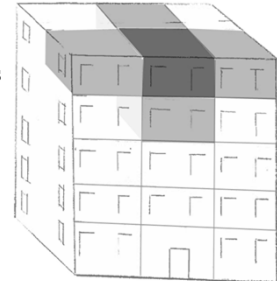
- Low cost inspection
 - Inspect beds only, focus on bed bug signs which are easy to detect
 - Suspicious but no live bed bugs, leave interceptor traps
 - >2 times faster than detailed inspections
- 99% effective



* Wang et al. Journal of Medical Entomology, 2016, 1-8
doi: 10.1093/jme/tjw018

WHAT ABOUT NEIGHBORING UNITS? SHOULD THEY BE TREATED?

- All surrounding units should be inspected (monitored) and treated if necessary



WORK WITH TENANTS



BED BUGS IN MULTIFAMILY HOUSING

- Management responsible to keep apartments free of pests
- Consider carefully whether it's in your best interest to charge tenants for bed bugs



SHARED TREATMENT COSTS

- Landlord pays for pest control service
- Tenant pays for encasements, interceptors at discounted rate



CONSIDER PREP OPTIONS

- Full prep
 - Bag all personal items and move furniture away from walls
- Minimal prep
 - Avoids moving bed bugs
 - May be best option for low and moderate infestations
 - Rely on customer to handle clothing, curtains, etc.



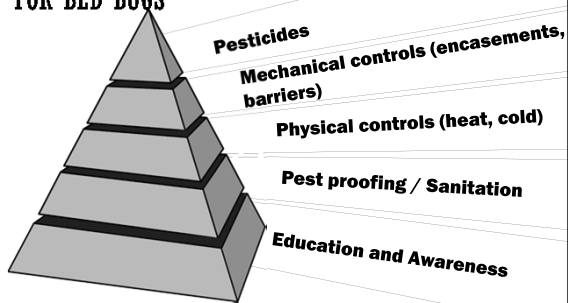
SANITATION AND ROOM PREP



USE A VARIETY OF CONTROL MEASURES



INTEGRATED PEST MANAGEMENT FOR BED BUGS



MIX IT UP

- Heat
 - Optional residual insecticides
 - Optional monitoring stations
- Pesticide-based
 - Optional steam, vacuuming
 - Barriers
 - Dusts
 - Residual sprays



MECHANICAL CONTROL

- Vacuuming
 - Remove heavy infestations quickly
 - Does not remove eggs
 - Use HEPA
- Physical barriers
 - Can help provide immediate protection from scattered bed bugs



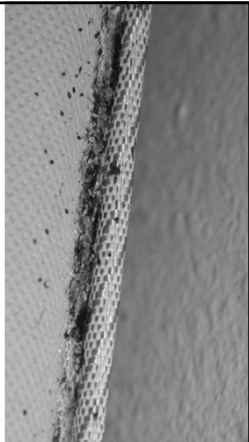
STEAM



- Provides immediate kill of all life stages
- Penetrates into cracks and 1-2 cm into fabric, up to 6 cm in cracks
- No pesticide residue

ENCASEMENTS

- Reduce the number of hiding places on mattress for bed bugs
- Eliminates the need to treat mattresses with insecticide
- Encases any remaining bed bugs so they cannot bite



WASHING

- Cleaning infested clothes
 - Hot-setting on drier 30 min.
 - Hot wash 30 mins. (140°)
 - Dry cleaning also effective at killing bed bugs, eggs



PESTICIDES

- Bed bugs tolerant of many insecticides
- Types of formulations
 - Aerosols
 - Dusts
 - Fumigants
 - sprays



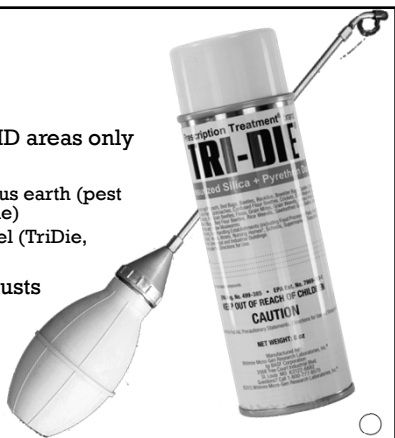
AEROSOLS

- Contact sprays
 - Pyrethrins (several Trade names)
 - EcoRaider and Bed Bug Patrol*
 - Pyrethroid sprays (Zenprox, others)
- Residual sprays
 - Aerosols with Phantom (chlorfenapyr), dinotefuran (Alpine) or imidacloprid
 - Combination sprays:
 - Temprid, Tandem, Transport, Crossfire



DUSTS

- Most for VOID areas only
- Dessiccants
 - Diatomaceous earth (pest control grade)
 - Silica aerogel (TriDie, Cimexa)
- Pyrethroid dusts
 - Tempo
 - Deltadust
- Other dusts
 - Alpine



FIND A GOOD CONTRACTOR



**HTTP://CITYBUGS.TAMU.EDU/FACTSHEETS
/BITING-STINGING/BED-BUGS/**

**TEXAS A&M
AGRI LIFE
EXTENSION**

How to Select a Bed Bug Control Provider

Since the early 2010s, bed bugs have become a major pest problem in homes, businesses, and other places of occupancy. The number of people who have reported bed bug infestations has increased significantly since 2010. In fact, according to a survey conducted by the Texas A&M University System, bed bug infestations are now the most common pest problem reported by homeowners in Texas.

Bed bugs are small, reddish-brown insects, about the size of an apple seed, that feed on human blood. They are most commonly found in bedrooms, but they can also be found in living rooms, dining rooms, and other areas of the home. Bed bugs are most active at night, and they can bite through clothing and bedding. They are also capable of surviving for several months without a blood meal.


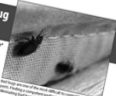
What to look for in a pest control company

The most important thing to look for in a bed bug control company is their experience and track record. A bed bug control company should have a proven track record of successfully treating bed bug infestations in homes and businesses. They should also have a good reputation for customer service and communication.


Other things to look for in a bed bug control company include their pricing, their response time, and their use of safe and effective treatments. Bed bug control companies should use a variety of treatments, including heat, steam, and insecticides, to ensure that all bed bugs are eliminated.

It is also important to choose a bed bug control company that is licensed and insured. This will ensure that you are protected in case of any accidents or damage during the treatment process.

Finally, it is important to choose a bed bug control company that offers a warranty on their work. This will ensure that you are protected in case the bed bugs return after the treatment.



QUESTIONS?



<http://citybugs.tamu.edu>