Integrated Pest Management (IPM) in the School Setting: Strategies for Protecting Children from Exposure

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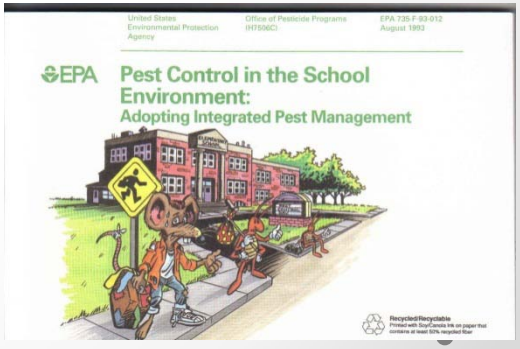
Texas AgriLife Extension Service School IPM Program

Integrated pest management

- It's not just pest control but a way to think and react to everyday actions.
- IPM is about roaches, rats, ants, bats, birds, weeds and more.
- IPM is also about maintaining the school building so it's safe for teachers and students.
- IPM is a about people working together.

History of School IPM

- U.S. EPA “introduced” school IPM in early 1990s
  - Grants were provided to land grant institutions to develop materials to help schools understand a different way to control pest.
- Regional IPM Centers founded to promote better adoption of IPM and research better solutions to problems in 1999.
  - Regional IPM Centers began promoting school IPM research in the new millennium



History of School IPM

- Texas & Michigan were first to Adopt School IPM Mandates – 1991 and 1992
- To date there are 39 states with some form of regulation or mandate that either requires or requests schools to follow IPM guidelines.
- Federal Legislation - School Environment Protection Act (SEPA) was introduced into Congress in 1999, but it has never succeeded as states prefer local control, rather than Federal.

EPA & USDA

- United in encouraging schools to adopt school IPM.
- Have developed a national strategic plan to have every school practicing school IPM by 2015.
- You can help this goal by understanding your role in Integrated Pest Management Program in your School.

IPM Defined

- IPM is a strategy using multiple control tactics to ensure that:
  - pest populations are managed at acceptable levels
  - risks to people, other non-target organisms and the environment are minimized
  - the pest control program is practical and economical

How is IPM different?

- IPM focuses on safe *and* effective ways to control pests
- Delicate balance between pests & pesticides
- Multiple tactics proven most effective
- Thresholds and monitoring ensure pesticides are used only when necessary
- Routine inspections & monitoring are essential – **routine spraying is not.**

Essential Ingredients for an IPM Program

- IPM Coordinator
- IPM Policy
- Employee Involvement
  - Pest management is people management
- Inspections and monitoring
- Pest identification
- Managed Treatments
  - Using action thresholds
  - Use of multiple control tactics
- Education

IPM Coordinator

- Is the designated person responsible for overseeing the day to day pest problems.
- Is also responsible for maintaining the building structure so that pests can't move into the building.
- This person often wears many hats and relies on school employees to help with reporting building repairs or pest problems.
- This person also ensures that advance notice of pesticide treatments is posted in the area that is to be treated.
  - For more information regarding this policy please contract your local coordinator for more information

IPM Policy Statement

- Should detail the districts intent towards IPM and what guidelines they will follow.
- Should have statements about monitoring, inspections, establishing thresholds, who can apply pesticides, how problems should be reported, and who should be educated about the program.
- Should be adopted by the School Board to set a standard for the district
  - In Texas it is found under the School Board Policies CLB (Legal) (Local)
- Additional areas for IPM to be successful
  - Work with the pest management professional to draft pest management plans.
  - Adopt an IPM (IAQ) committee to meet periodically to discuss environmental issues for the district.
  - Educate teachers, custodians, food service, maintenance and grounds workers about their role in IPM.

Employee Involvement

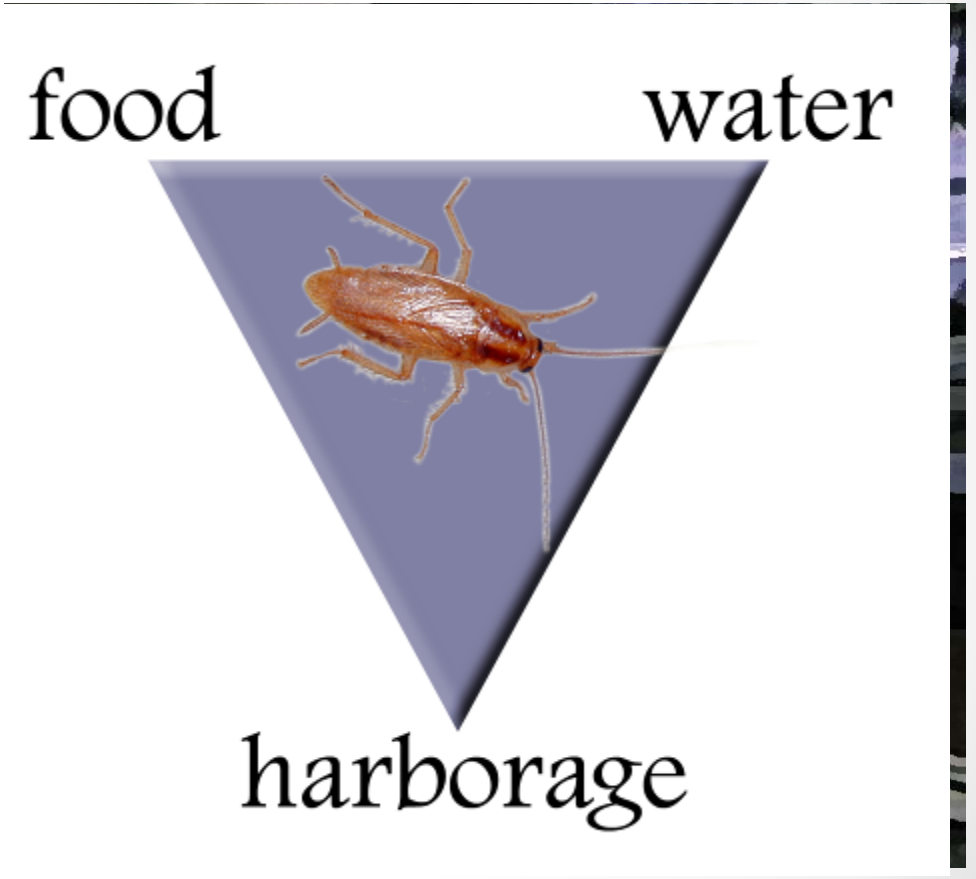
- Remember IPM is everyone's Job!
- Everyone has a role to play when it comes to IPM
  - Report broken doors, leaky faucets, cracked windows.
  - Pick up clutter in your room
  - Don't leave food, crumbs, candy and other items around.
  - Store food items in locking plastic containers
  - Report food and drink spillages when they occur.

Inspections

- Simple
  - These types of inspections are often conducted by the pest control company or licensed pesticide applicator
    - Done on a monthly basis
- Intense
  - Reviews the entire building integrity looking for pest entry ways or hiding places
    - Done annually or every other year based on age
- New issue
  - Complaint comes in to a non-monitored area
  - Critical for public health pests

What is an IPM inspection?

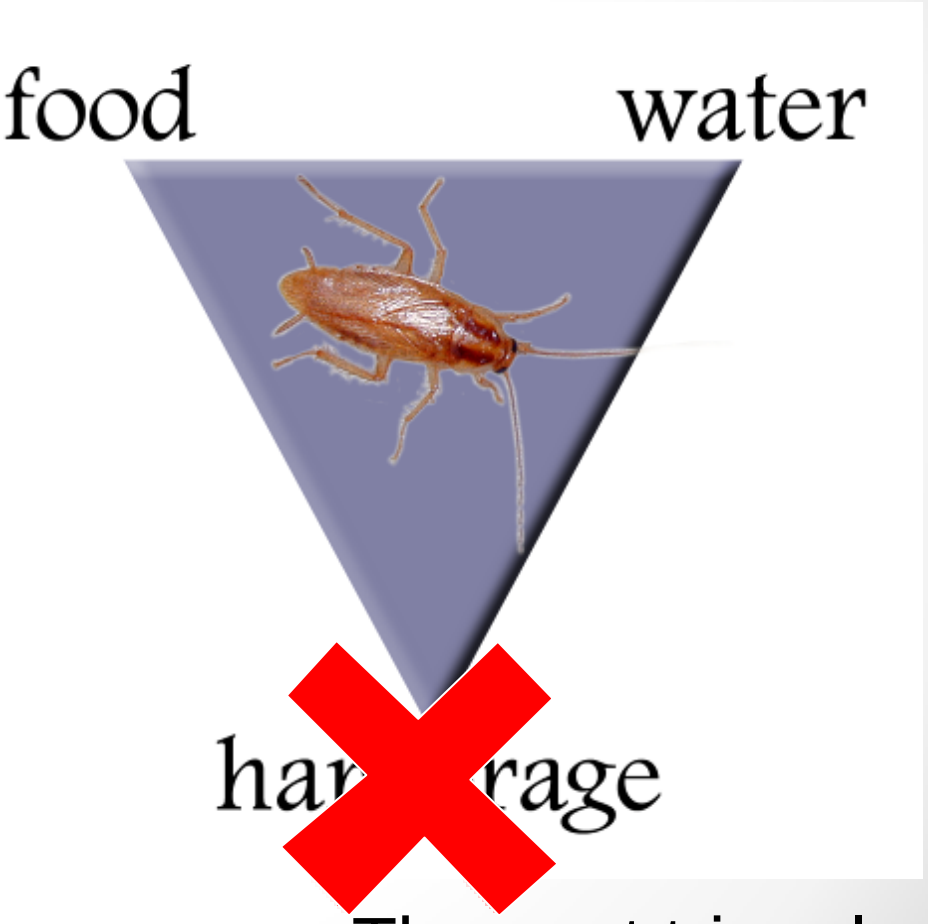
- Goes beyond sanitation
- Looks for critical things pests need
  - o food
  - o water
  - o temperature
  - o harborage



The pest triangle

What is an IPM inspection?

- Reduce a "requisite" - reduce a pest
- Sanitation, not pesticides will control pests



The pest triangle

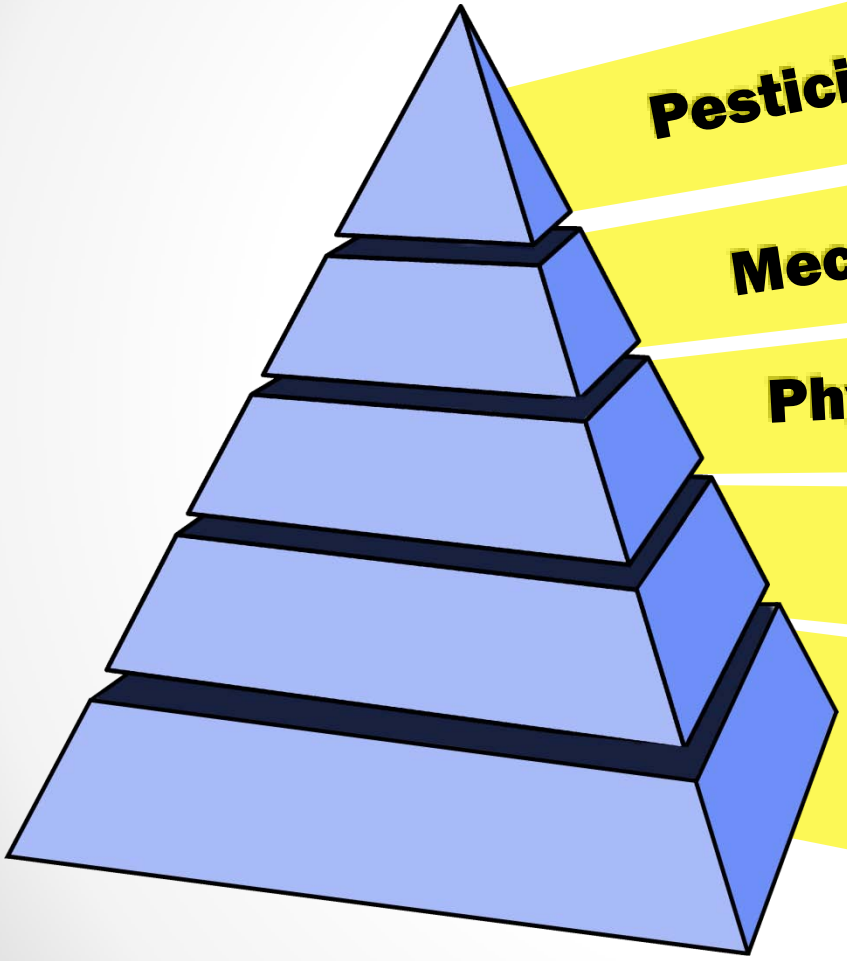
Monitoring

- Monitoring/sampling
  - *Monitoring* - sampling over time to observe trends and changes in pest activity
  - Uses a simple device (glueboard, sticky trap)
  - *Sampling* - observing and recording pest presence or numbers
    - Trap checking to see if control measures are working or not.

Reporting

- Pest sighting logs
  - Notebooks placed with food service and campus secretary
- Work orders
  - Online system to report pest complaints and building problems
- Contact IPM Coordinator
  - Designated person of contact
- Report to secretary, head custodian, others
  - Someone who can contact building services for notification of problem.

IPM pyramid



Pesticides

Mechanical controls (traps, barriers)

Physical controls (heat, light, cold)

Education/Awareness

Pest proofing/Sanitation

Common Pests in Schools

- **Cockroaches:**
  - Skin fragments and feces are the most common cause of asthma in urban youth.
  - They are also responsible for transmitting several food born illnesses
- **Ants:**
  - Fire ant stings cause several human deaths per year.
  - Several ant species can invade electrical equipment

Common Pests in Schools

- **Rodents:**
  - Deadly hantavirus is transmitted by rodent urine and feces
  - Transmits several food born illnesses
  - Has been linked to plague thru fleas
- **Bees & Wasps**
  - Stings can cause allergic reaction
  - Rapid development of nest in some cases overnight
-

Forces affecting IPM today

- School/Community IPM Initiatives
- LEED buildings
- Certification programs
- Clean Water Act
- Bed bugs
- Insurance – Termite warranty work

Bed Bugs

What to do if you encounter this pest at your school

More Information

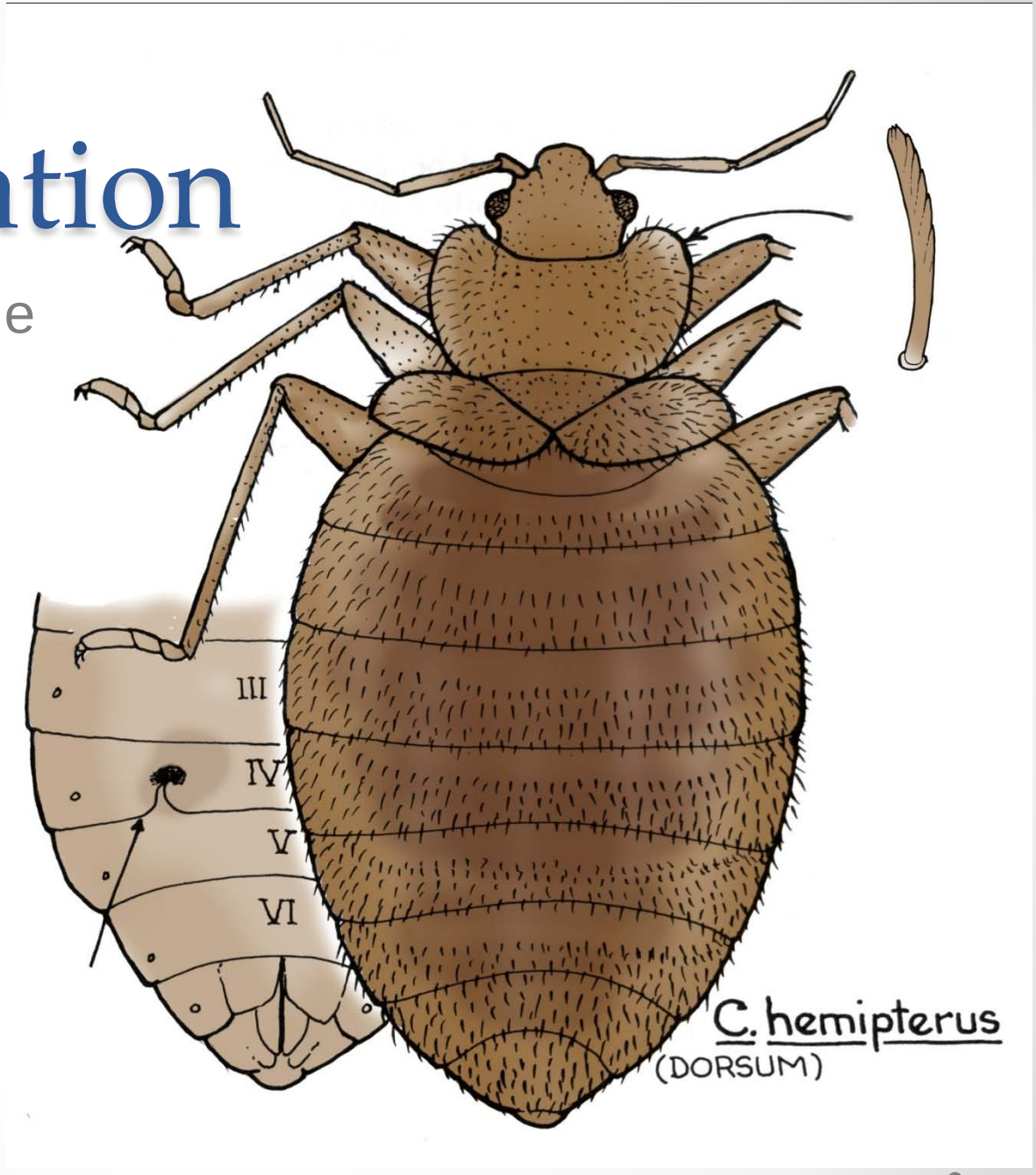
- Texas AgriLife School IPM Program
  - http://schoolipm.tamu.edu
  - http://Citybugs.tamu.edu
- National School IPM Information Source
  - http://schoolipm.ifas.ufl.edu/
- US EPA – Healthy Schools
  - http://cfpub.epa.gov/schools/index.cfm
- IPM Centers
  - http://www.ipmcenters.org/
- IPM Institute of North America
  - http://www.ipminstitute.org/

Bed bug IPM: A brief overview

Michael Merchant, PhD, BCE
Texas AgriLife Research and Extension Center at Dallas

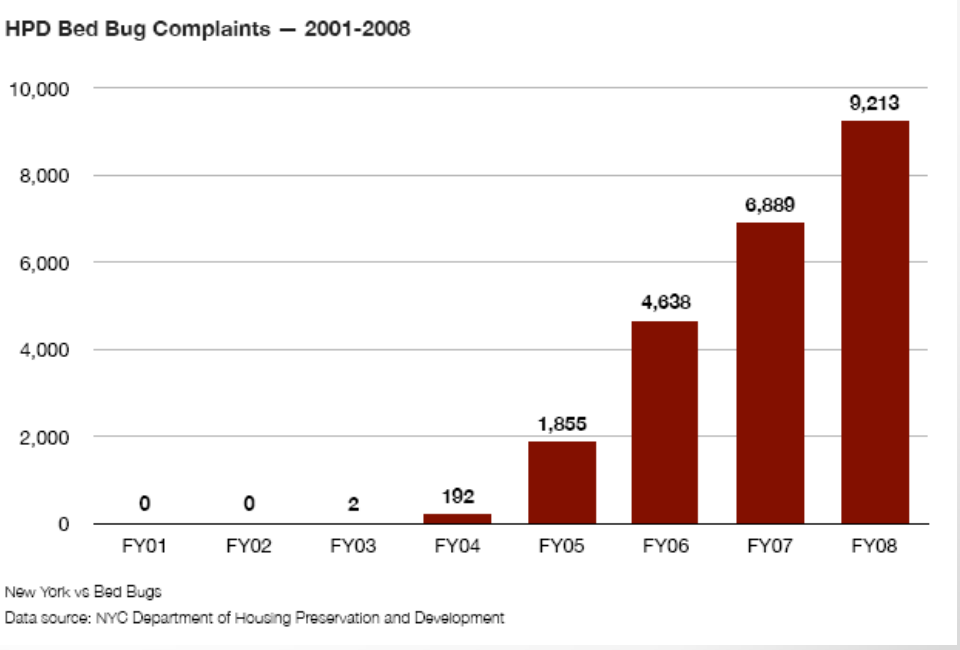
Identification

- 4-5 mm-long (size of apple seed),
- mahogony-colored, wingless, flattened
- Pronotal bristles toothed (microscopic)



Bedbugs

- Infestations increasing nationwide
- Adults approx. 3/16 inch-long
- Hide in cracks and crevices during day
- Previously fed adults can survive 6-7 months without human host
- Must feed on blood from humans, pets, birds or bats



Bed bug feeding habits

- Prefer feeding during darkness
- Bites painless
- 50% of people with bed bug infestations may not know they are being bitten
- High risk of infestation moving from one apartment to adjacent apartment


Photo by M. Merchant

Photo by clairebelles, courtesy Flickr

Challenges with bed bugs

- Hiding places diverse
  - 50% on or around bed
  - Upholstered chairs, sofas, nightstands, dressers, other furniture
  - Baseboards, under carpet tack strip, any small cracks, behind posters, clocks, etc.
- Replacing mattress more a problem than a solution
  - Mattress and box spring encasements the answer

Challenges with bed bugs

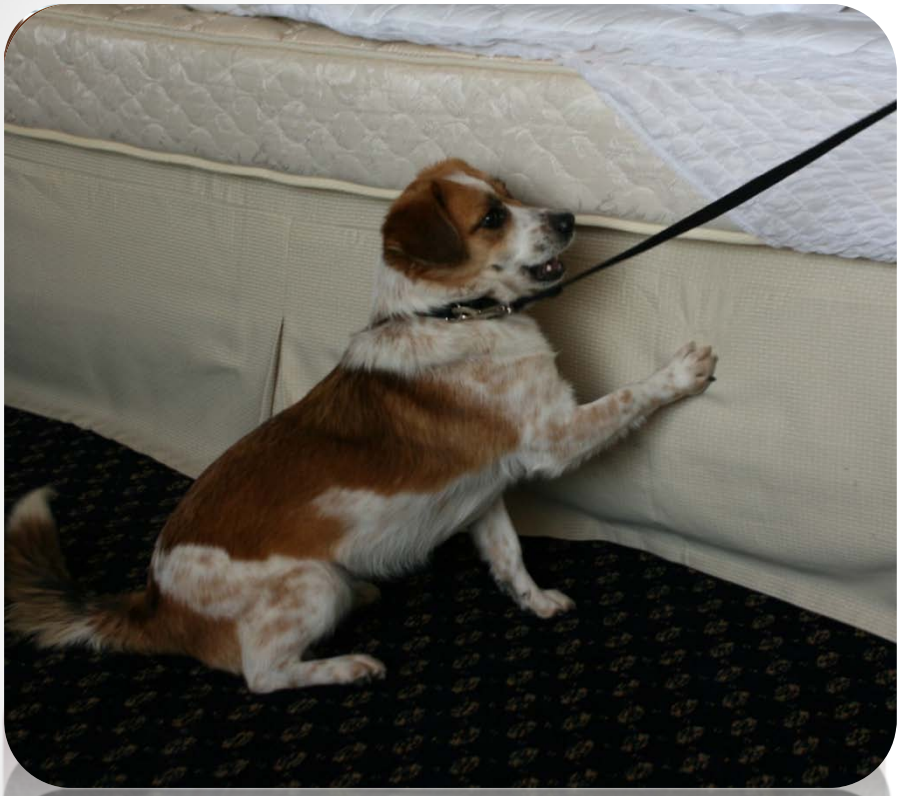
- Control expensive
  - Labor-intensive
  - Success highly dependent on customer cooperation
  - Cleaning infested clothes
    - Freeze 10-12 hours min.
    - Hot-setting on drier 30 min.
    - Hot wash 30 mins. (140^{o})
    - Dry cleaning effective
  - Pesticides not highly effective

Challenges with bed bugs

- Bed bugs are excellent hitchhikers
  - Suitcases
  - Clothing
  - Backpacks
- Bed bugs are good runners

Photo by Ed Yourdon, Flickr

Monitoring and detection



- Look for fecal specks and bugs around beds
  - Headboards in hotels
  - Mattresses in homes
- Sticky cards not very effective
- CO_2 traps becoming more useful
- New passive monitoring traps
- Dogs

More Information

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The economics of bed bugs

- Bed bug treatment expensive $500-$1500+ per apartment
- Mattress encasements $50-$150
- Apartment associations writing pre-lease agreements
  - No bed bugs in prior apartments
  - Pre-checks to ensure apartments are bed bug-free
- System rigged to discourage renters from reporting bed bugs

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