

## Bed Bug Presentations

Allie:

- Introduction to IPM
- Bed Bug Biology & Behavior
- Prevention and control

Lori:

- BHA's Bed Bug Program



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## Introduction to IPM

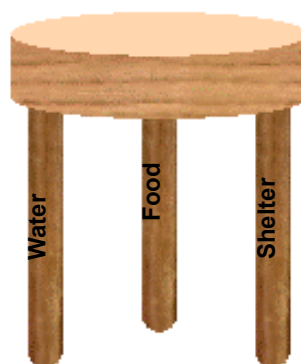
## The IPM Process

In a structural setting, an IPM program consists of

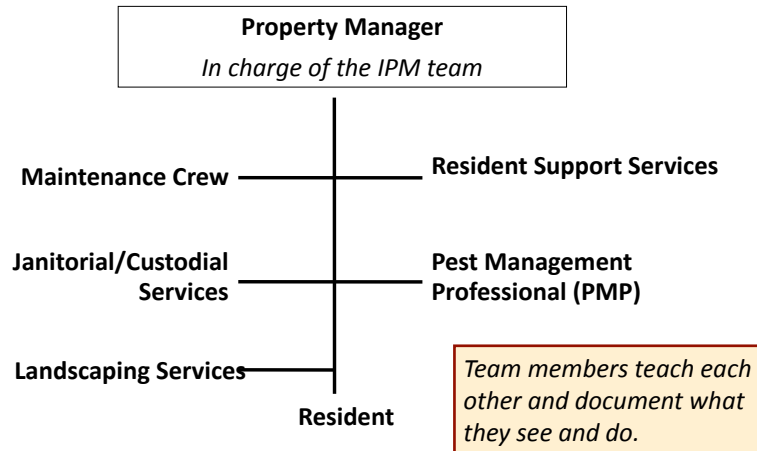
1. inspection,
2. identification,
3. establishment of threshold levels,
4. employment of two or more control measures (which may be cultural, mechanical, biological, or chemical), and
5. evaluation of effectiveness

## What all pests need

- Food
- Water
- Shelter



## The IPM team



## Bed Bug Biology and Behavior

## Bed bugs are health hazards

Bed bugs do not transmit disease, but they

- cause secondary infections after people scratch their bed bug bites;
- result in stress, loss of work, loss of sleep, and financial burden;
- are unwelcome in our homes and workplaces.

## What is a bed bug?

- A blood-sucking insect
- Most active at night
- Usually feeds at night



**Adult bed bug feeding on a human**

## Bed bug life cycle



**Bed bugs at various stages of growth.**

## Bed bug behavior

- Hide in cracks and crevices, often in groups.
- Cannot fly, jump, or burrow into skin...they crawl.
- Hitchhike on bags, furniture, wires, or pipes.



**Bed bug crawling into a screw hole to hide.**

## Can be confused with...

- Ticks
- Cockroach nymphs
- Other kinds of bug bites



Tick



Mosquito Bites



Cockroach Nymph



Bat Bug

## Signs of bed bugs

- Bites
- Blood spots
- Shed skins
- Dead bed bugs
- Live bed bugs



## Fecal spots or "blood spots"

- Blood spots are bed bug droppings.
- Bed bugs cannot be confirmed by blood spots alone.
- Live bed bugs must be found.

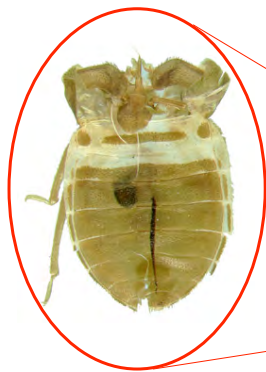


**A bad infestation**



**The start of an infestation**

## Shed skins



**Bed bug signs on a mattress seam**

## What bed bugs eat and drink

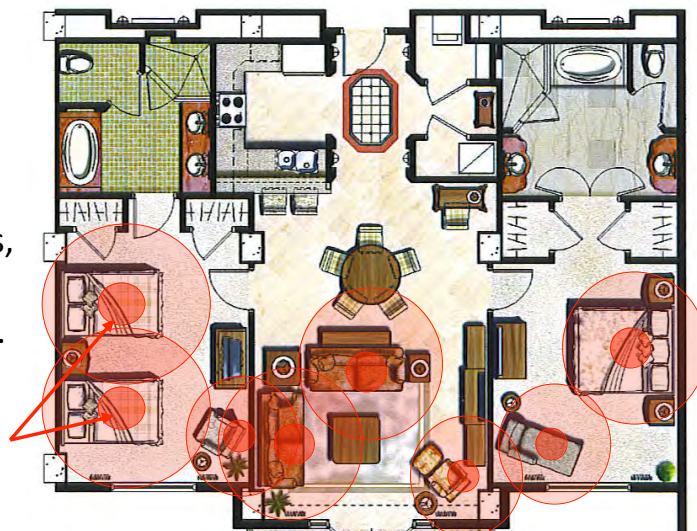
Blood



## Where bed bugs live

Beds,  
sofas,  
bedside  
tables,  
recliners,  
picture  
frames...

● = Hot Spot





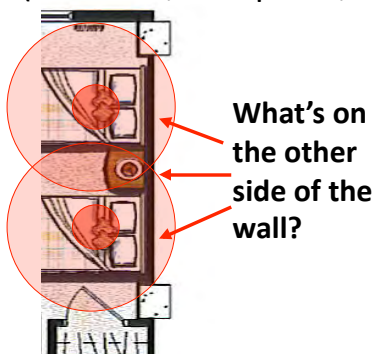
## Where to look (in order of most to least often infested)

1. Beds
2. Bedding
3. Baseboard/carpet edges
4. Furniture
5. Upholstered furniture
6. Walls and ceilings
7. Clothing
8. Appliances

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## How do bed bugs spread?

- Through walls along wires and pipes
- On anything coming from an infested unit (furniture, backpacks, laundry...)



## Bed Bug Control



## How to prevent getting bed bugs

### **Advice for residents:**

- Keep coats, backpacks, purses, and bags off beds, recliners, and sofas.
- Don't bring home used furniture.
- Look for signs before sleeping.

### **Advice for staff:**

- Always inspect
- Do not set belongings or equipment on furniture
- Keep clothing simple or wear covers
- Kill any bed bugs on fabric using a dryer

## Working in an infested unit

- Always inspect before sitting on or carrying an item.
- Take precautions to not infest equipment.
- Wrap infested items before transport.
- If the infestation is heavy, wear booties and a tyvek suit.
- Put clothes in a hot dryer for 20 minutes after work.

## Got bed bugs? Now what?

If found and controlled early in the infestation, the spread of bed bugs can be stopped.

The first responses should be to:

- Report the problem—keep records
- Not throw the mattress out—cover it
- **Not spray or bomb—leave this to the PMP**
- Prevent carrying the bed bugs to other places

## Bed Bug Response Plan

1. Professional scheduled to inspect infested and adjacent units.
2. Resident 48 hour notice instructions – clean and organize as if for a housekeeping inspection.

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## Bed Bug Response Plan (cont.)

3. Pest management professional inspects with property management or maintenance.
  1. If a light infestation
    1. Treat using least toxic, most effective method; and
    2. Schedule next visit.
  2. If an extensive infestation or clutter
    1. Give resident site-specific instructions; and
    2. Schedule next visit.
4. Conduct follow-up inspection.

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## Concepts to guide your procedures

- All parties must communicate with each other.
- Aim for early intervention and thorough treatment by an experienced, qualified professional.
- Do not disrupt the area before the professional has planned the treatment.
- Each treatment should be site-specific and take into consideration the people, the surrounding units, and the extent of infestation.
- Don't depend on residuals—the PMP must visit twice.
- Prevent reinfestation by encouraging compliance with and enforcing rules around
  - ✦ granting access to the PMP for regular service,
  - ✦ reporting infestations to property management,
  - ✦ bringing home used furniture,
  - ✦ disposing of infested items, and
  - ✦ using pesticides (no application without an applicator's license).

## Treatment Methods Covered

1. Inspection,
2. Monitoring, and
3. Non-Chemical Treatment Options

More topics, including pesticides, are covered in a report that you can download at:

[www.nchh.org/Portals/0/Contents/bedbug\\_report.pdf](http://www.nchh.org/Portals/0/Contents/bedbug_report.pdf)

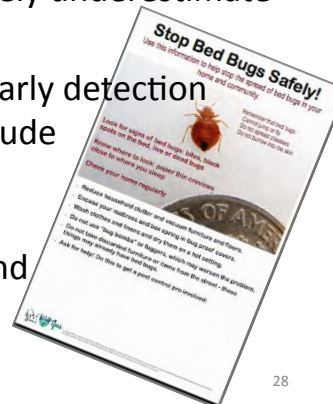
# 1. Inspections

- *Intent:* To determine the extent of the infestation and condition of the unit in order to plan a site-specific treatment.
- *Methods:*
  - Visual Inspections
  - Inspections Using Bed Bug Detection Canine

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## Visual Inspections

- *Pros:* Effective when done by a trained inspector. Opportunity to educate residents.
- *Cons:* May miss bed bugs or severely underestimate the number.
- *Recommendations:* Essential for early detection and a well planned treatment. Include adjacent units. Conduct monthly. Residents and aides need to know what to look for, where to look, and what to do if a bed bug is found.



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## Canines

- *Pros*: Effective at assessing and monitoring situation quickly.
- *Cons*: Cost. Concern with false positives. Dog needs special care and regular training. Can have a bad days too.
- *Recommendations*: Use for property-wide inspection, monitoring, verifying treatment success, and investigating reported problems when visual inspection fails to find a bed bug.

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## 2. Monitors

- *Intent*: Identify the presence of a bed bug infestation.
- *Methods*:
  - Passive—no attractant
  - Active—attractant

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## Passive: Moat-style Interceptors

- *Pros:* Design traps bed bugs. Cost effective. Reassures residents.
- *Cons:* Requires maintenance, not made for all beds, can be compromised, and new to the market.
- *Recommendations:* Should be used as a complement to other methods.



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## Passive: Monitor

- *Pros:* Cost effective. Reassures residents.
- *Cons:* New to the market.
- *Recommendations:* Should be used as a complement to other methods.



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## Portable Monitoring Device

- *Pros*: May be more effective than interceptors because it does not depend on humans to attract bed bugs.
- *Cons*: Expensive, can get bed bugs on them, and new to the market.
- *Recommendations*: Useful in vacant units. Needs more research.

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## 3. Non-Chemical Treatment Methods

- *Intent*: To Kill bed bugs and eggs and eliminate harborage without pesticides.
- *Methods*:
 

• Clutter Removal	• Laundry
• Disposal of Infested Items	• Steam
• Isolation in Plastic Containers or Bags	• Mattresses and Box Spring Encasements
• Petroleum Jelly	• Freezing
• Metal Furniture	• Vacuums
• Cleaners	• Ambient Heat Treatment
	• <i>Ineffective Methods</i>

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## Disposal of Infested Items

- *Pros:* Gets rid of unsanitary items and bed bugs.
- *Cons:* May be daunting to residents. May disrupt bed bugs.
- *Recommendations:* Let the professional determine what needs to be thrown away. When removing: wrap up, take out, and destroy.

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## Isolation in Plastic Containers or Bags

- *Pros:* Simplifies treatment. Keeps items from becoming infested. May reassure residents.
- *Cons:* Items must be well contained. Can get expensive and inconvenient.
- *Recommendations:* Good option based on extent of infestation, resident capabilities and needs, and available treatment methods. Make sure PMP tells the resident when it's okay to stop living out of containers.

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## Metal Furniture

- *Pros:* Hinders bed bug movement. Facilitates inspections compared to wicker or wood.
- *Cons:* Must be kept clean, rust-free, and holes may need to be sealed.
- *Recommendations:* Option to consider when purchasing items in area likely to be infested.

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## Laundry

- *Pros:* Practical and effective, especially when used with dissolvable laundry bags.
- *Cons:* May spread bed bugs on the way to or in the laundry room.
- *Recommendations:* After PMP has given instructions on what to wash, use dissolvable bags and the hottest setting for the washer and dryer that fabrics can handle. Place clean laundry in plastic bag. If resources are limited, skip the wash and dry for 30 minutes.

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## Steam

- *Pros:* Kills bed bugs and eggs without chemical residue.
- *Cons:* Does not penetrate materials very deep. Pressure may spread bed bugs. Moisture may damage materials. Time consuming.
- *Recommendations:* Vacuum first, then steam. Use for hard to treat items such as sofas and wheelchairs. Option to consider but use with care.

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## Mattress Encasements

- *Pros:* Reduce hiding places and make visual inspections easier. Also reduces dust mites.
- *Cons:* Must be kept on for one year. \$50 may be cost prohibitive.
- *Recommendations:* Practical and effective. Don't go cheap. Make sure it fits snugly. Pesticide-impregnated liners unproven by peer-reviewed research and may further resistance.



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## Freezing

- *Pros:* Dry ice may be effective without leaving chemical residue.
- *Cons:* Unproven and costly. May not penetrate materials. May disperse bed bugs.
- *Recommendations:* Using a household freezer or the outdoors is not recommended. Dry ice machine is an option, but is not as vetted as steam. Take care to avoid burns when handling.

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## Ambient Heat Treatments

- *Pros:* Useful where unit preparation is difficult or unlikely. No chemical residues.
- *Cons:* Difficult to effectively heat entire unit to more than 120°F. Bed bugs may spread to adjacent units. Costly.
- *Recommendations:* Complicated so must be done by a trained professional. A viable option.

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## Ineffective Non-Chemical Methods

- Increasing the heat in the infested area with a thermostat.
- Putting items in black plastic bags and leaving them in the sun for a day.

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## 4. Pesticides

- *Intent*: Kill bed bugs and eggs using chemicals. Leave residue that keeps killing.
- *Methods*:
  - Pyrethroids      - Chlorfenapyr
  - Dusts              - Insect Growth Regulators
  - Fumigation      - Essential Oils
- NOTE: Don't use rubbing alcohol / isopropyl alcohol. Rubbing alcohol does not have a pesticide label and is flammable.

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## Pesticides

- *Pros*: Quicker and cheaper than many other control methods if you can find the bed bugs.
- *Cons*: No silver bullet. Bed bugs are becoming resistant to several types. Residual exposures.
- *Recommendations*: Don't use total release foggers. Have a licensed professional apply. Address residents' potential misuse of over-the-counter products.

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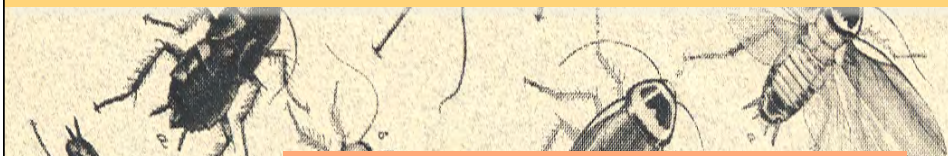
## For More Information:

- Allison Taisey  
[aat25@cornell.edu](mailto:aat25@cornell.edu)
- Comprehensive Integrated Pest Management (IPM) Training:  
[www.healthyhomestraining/ipm](http://www.healthyhomestraining/ipm) or [www.stoppests.org](http://www.stoppests.org)
- Locally developed educational materials:  
[www.bphc.org/hpfhi/AboutUs/Pages/home.aspx](http://www.bphc.org/hpfhi/AboutUs/Pages/home.aspx)
- Pesticide questions: The National Pesticide Information Center at  
<http://npic.orst.edu> or 800-858-7378

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## IPM AT THE BHA TIPS FOR A SUCCESSFUL PROGRAM



Boston Housing Authority

Presented by Lori Luce,  
Maintenance Systems Manager

### **“Think Like a Pest”**



What does a pest need to live happily?

1. Shelter
2. Food
3. Water

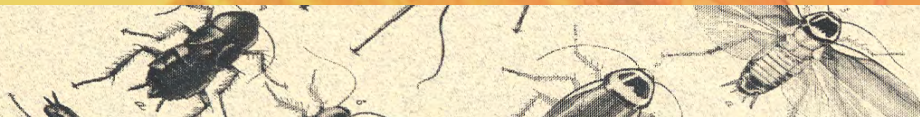


## Commonsense IPM basics



- Identify pest problems through inspection and monitoring.
- Block entryways.
- Remove food sources.
- Clean up spills/condensation and repair leaks
- Use low-toxicity, low-risk pesticides only as needed.
- Tenant and staff education/behavior change.

## IPM Basics



- Notify all residents of inspection, service and preparation requirements
- Commit to entering 100% of apartments
- 1 year contract with no lapses
- Apartments with visible infestation, conditions conducive to pests, not initially inspected or not properly prepared will require follow up
- Get assistance or enforce lease for residents who can not or will not comply
- Don't let residents use pesticides. Encourage them to report problems and leave it up to the professionals.

## Creating a good contract specification



- Designate or become an IPM team leader
- Hire a tenant coordinator or peer educator
- Have a pre-inspection community meeting
- Require the contractor to inspect entire facility
- Require Hepa filter vacuuming
- Require exclusion, blocking holes and entry ways
- Treat with low risk pesticides only where visible infestation exists
- Require monitoring of infestation levels
- Require good documentation
- Require follow up meetings with the technician and tenant coordinator
- Require the contractor to educate residents and staff
- Incorporate IPM in vacancy turnaround and capital construction

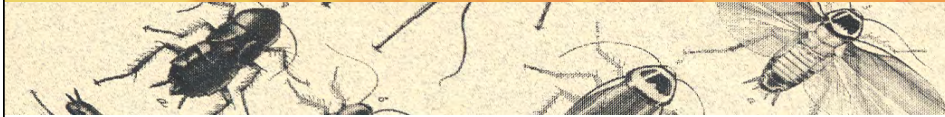
## Choosing a Contractor FAC50



Link to prequalified IPM vendors that can be used by any public entity in the state of Massachusetts without having to go through the rigorous prequalification and bidding process. A good reference for private landlords, too.  
(Commonwealth-Procurement Access and Solicitation System)

[www.comm-pass.com](http://www.comm-pass.com)

## Choosing a Contractor



### Other links to IPM contractors:

New England Pest Management Association

[www.nepma.org](http://www.nepma.org)

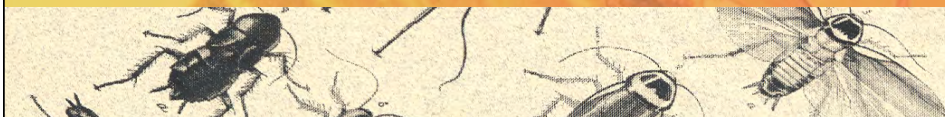
National Pest Management Association – Quality Pro

[www.npmaqualitypro.org](http://www.npmaqualitypro.org)

National Pest Management Association – Green Pro

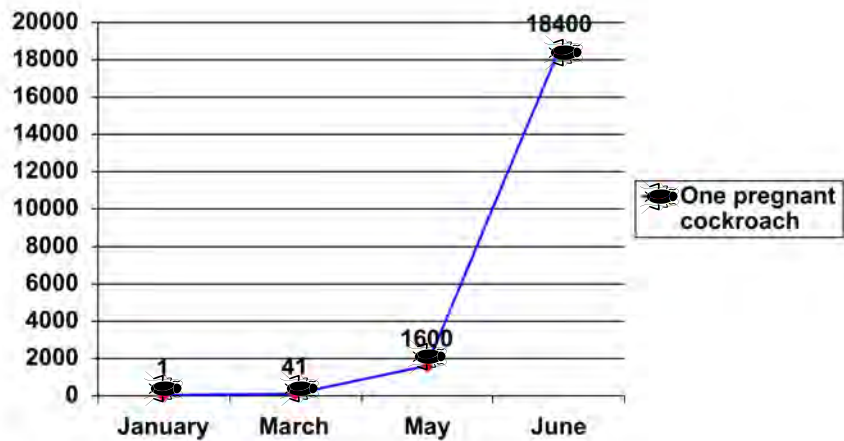
[www.npmagreenpro.org](http://www.npmagreenpro.org)

## Focus resources on problem units

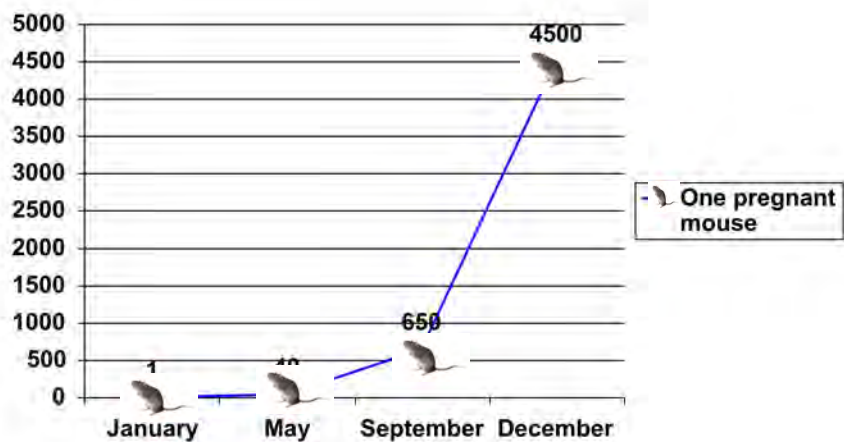


- “Focus units” have visible infestation, conditions favorable to pest life, or were not prepared for inspection.
- Add apartments to list of focus units based on:
  - ✦ Contractors initial inspection
  - ✦ Residents’ complaints
  - ✦ Employee reports
  - ✦ Regulatory agency complaints
- Remove apartments from the list as conditions improve.

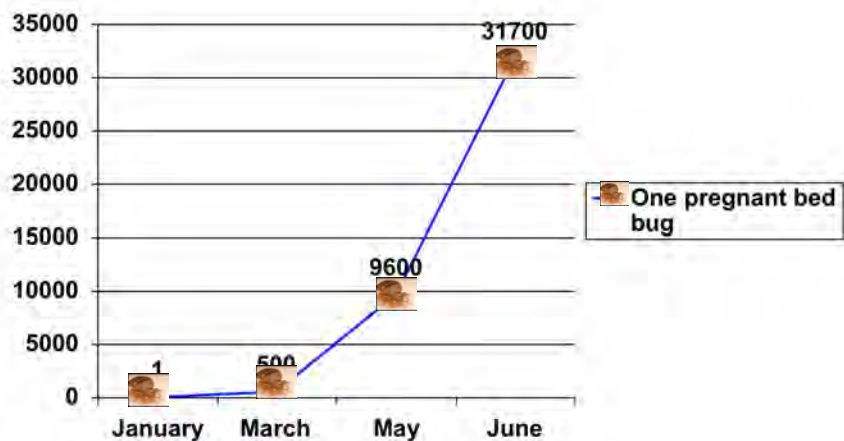
## One German Cockroach, HALF a year.....



## One Mouse, One year.....



## One Bed Bug, Half a year.....



## Training Available

National Center for Healthy Housing:

<http://www.nchh.org/Training/Healthy-Homes-Training-Center/Integrated-Pest-Management-in-MultiFamily-Housing.aspx>

Integrated Pest Management: A Guide for Managers and Owners of Affordable Housing:

[http://asthmaregionalcouncil.org/uploads/IPM/asthma\\_ipm\\_guide.pdf](http://asthmaregionalcouncil.org/uploads/IPM/asthma_ipm_guide.pdf)

Guidebook for Structural Approaches to Integrated Pest Management:

<http://www.bphc.org/hpfi/SiteCollectionDocuments/English%20Documents/BHA%20IPM%20Structural%20Guidebook.pdf>

## Develop Community Partners



Healthy Pest Free Housing Initiative made possible by the W.F. Kellogg Foundation and the EPA:

1. Boston Public Health Commission
2. Boston Housing Authority
3. Committee for Boston Public Housing
4. West Broadway Task Force
5. Boston University School of Public Health
6. Asthma Regional Council
7. Massachusetts Public Health Association
8. Boston Urban Asthma Coalition

## Quality Assurance



Inspection: Did Contractor do thorough inspection – all rooms?  
Flashlight? Did they bring their HEPA vac and did they use it?

- Talk with tenant coordinator, residents, and staff, they will have first hand knowledge of the service provided by the contractor.
- Accompany pest control technician
- Review documentation
- Do your own inspection of parts of your property after the inspection phase and compare to contractors results
- Are spec's being followed? Exclusion, vacuuming, treatment and reporting

## Summary

- Have frequent meetings
- Provide written literature and training to residents and staff
- Require preparation
- Commit to entering all apartments and enforcing the lease when necessary
- Commit to making repairs that effect pest infestations in a timely manner
- Monitor the performance of your contractor and staff

## IPM AT THE BHA TIPS FOR A SUCCESSFUL PROGRAM



Questions and Answers



The End