

Integrated Pest Management in Multifamily Housing: Bed Bugs



Retirement Housing Foundation

IPM Training Part 3.

October 29, 2020

Susannah Reese, StopPests in Housing

sck27@cornell.edu

Karey Windbiel-Rojas, UC Statewide IPM Program

kwindbiel@ucanr.edu

1

1

Developed and sponsored by



United States Department of Agriculture
National Institute of Food and Agriculture



The Northeastern IPM Center receives support from the U.S. Department of Housing and Urban Development's Office of Healthy Homes and Lead Hazard Control through USDA-NIFA to facilitate this program.

Products appear in this presentation for illustrative purposes and are not meant as an endorsement.

2

2

Poll

How often do you see signs of bed bug infestations in the homes you work in?

- Frequently
- Sometimes
- Rarely
- Never

3

What all pests need

- ~~• Food~~
- ~~• Water~~
- ~~• Shelter~~

Can we eliminate these for bed bugs?



4

4

Outline

- ✦ What they are
- ✦ What they eat
- ✦ Where they live
- ✦ How to think like a bed bug
- ✦ Prevention
- ✦ Monitoring and inspection
- ✦ Assessment-based control

Also known as...

- chintzes or chinchies
- mahogany flats
- red coats
- crimson ramblers
- wall lice
- the bug that nobody knows



5

5

What is a bed bug?

- ✦ Blood-sucking insect
- ✦ Flat
- ✦ Size range-sesame seed to apple seed
- ✦ Light brown to mahogany red (depends on feeding)



Adult bed bug feeding

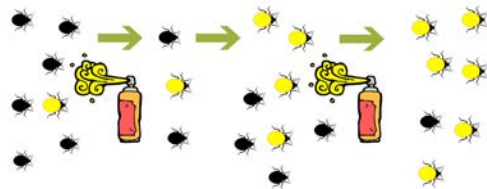
6

6

Why they're back



- ☒ Change in pesticide availability
- ☒ Change in pesticide use patterns
- ☒ More travel/ mobility of people
- ☒ More infested locations
- ☒ Lack of preparedness of society
- ☒ Pesticide resistance (occurs in 2-20 yrs)



7

7

Pest of public health significance

- ☒ Stress
- ☒ Loss of work, productivity, and sleep
- ☒ Financial burden
- ☒ Secondary infections from scratching bites
- ☒ Unwelcome in homes and workplaces
- ☒ Bed bugs are not known to transmit disease
- ☒ *New evidence suggests allergens are associated with bed bugs*



8

8

Biology



Bed bugs mating



Close up of eggs

- ☛ Females lay less than 200 eggs in a lifetime; 1-5 eggs/day
- ☛ Egg to adult = 5 weeks to 4 months
- ☛ 5 nymph stages
- ☛ Molt (shed skin) 5 times
- ☛ Must feed before each molt



Adult and nymphs

9

Bed bug life cycle



Fed



Not recently fed

10

10

The feeding process

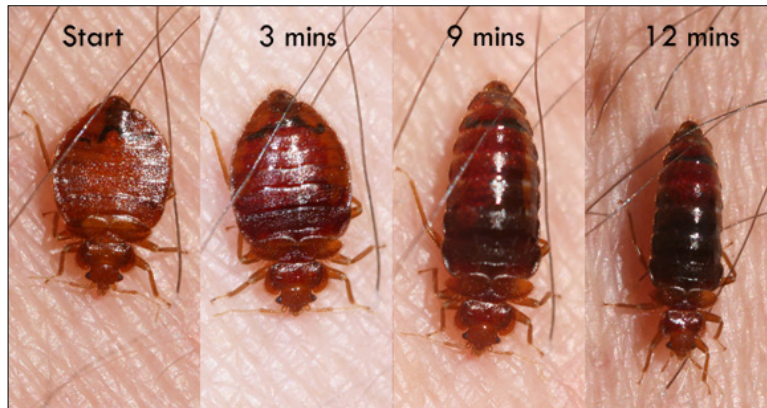


Photo: Whitney Oranshaw

11

Bed bug behavior

- ☛ Most active at night
- ☛ Hide in cracks and crevices
- ☛ Often in groups
- ☛ Hitchhike on coats, bags, furniture, wheelchairs...
- ☛ **Cannot fly, jump, or burrow into skin...they crawl**



Photo: Dr. Dawn Gouge

Hiding in a screw hole

12

12

What bed bugs eat and drink

Blood



13

13

Can be confused with...



Carpet Beetle and larva



Cockroach Nymph



Tick



Mosquito Bites



Spider Beetle

14

14

Signs of bed bugs

- ☒ Bites
- ☒ Fecal spots
- ☒ Shed skins
- ☒ Dead bed bugs
- ☒ Live bed bugs



15

15

Where bed bugs live

- ☒ Primarily inside homes and buildings
- ☒ In any crack or crevice where a credit card edge could fit
- ☒ On any item near where people rest



Couch cushion zippers



Mattress piping



Stuffed animals



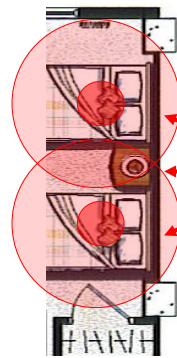
Switch plates

16

16

How do bed bugs spread?

- ☛ Actively crawl along wires, pipes, and under doors
- ☛ Passively on anything coming from an infested unit (furniture, backpacks, laundry...)



What's on the other side of the wall?



17

17

Prevent introduction and spread

Staff, health aides, and contractors:

☛ In units:

- ☛ Prior to entering, use insect repellent on yourself (Not rubbing alcohol)
- ☛ Avoid sitting or placing personal items on surfaces
- ☛ Wear a protective layer when moving infested items
- ☛ Inspect after leaving (can use lint roller)



☛ In the main office/community areas:

- ☛ Avoid fabric-covered furniture that has many crevices
- ☛ Purchase plastic or metal items when replacing furniture
- ☛ Have residents set their belongings in plastic totes during meetings
- ☛ Vacuum office regularly
- ☛ Use monitors



18

18

Prevent introduction and spread

Residents:

- ✦ Keep coats, backpacks, purses, and bags off beds, recliners, and sofas
- ✦ Inspect used furniture carefully before bringing it home - avoid it if possible
- ✦ Look for signs when sleeping away from home
- ✦ Launder bedding after visitors

Smooth plastic totes can keep clean items bed bug free or contain items with bed bugs



19

19

Areas at risk for introduction and infestation

- ✦ Introduction is likely where people
 - ✦ frequently travel
 - ✦ set down personal belongings
 - ✦ sit or lay down for long periods of time
- ✦ Infestation is likely where bed bugs can
 - ✦ Crawl (upholstered furniture or bedding)
 - ✦ Feed on a person for 5 minutes without being detected
 - ✦ Hide in cracks or folds

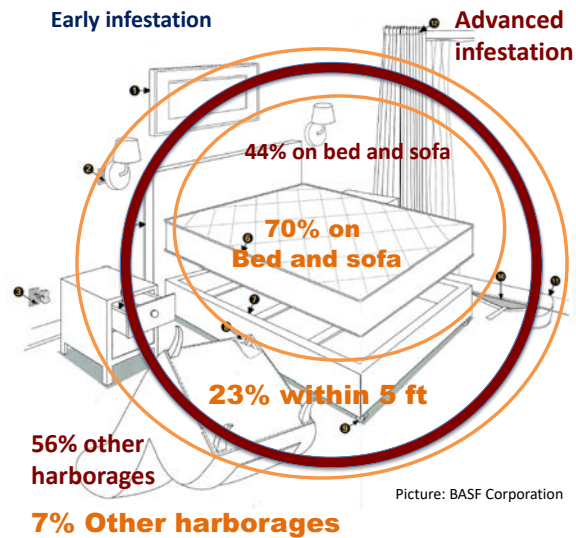


20

20

Early detection is key

- ☒ Early infestations usually close to the bed
- ☒ Typically take 2-3 treatments
- ☒ Advanced infestations spread and cost more to control
 - ☒ 5 or more treatments



21

We cannot rely on complaints

Many don't report because:

- ☒ Afraid of being charged \$ or evicted
- ☒ Embarrassed to complain
- ☒ Unaware of the signs
- ☒ May not react to bites

Use monitors and proactive inspection!



22

Bed bug monitors

- ☛ Interceptors plus visual inspection can detect up to 95% of infestations
- ☛ Trap and kill bed bugs
- ☛ Determine how bad infestation is
- ☛ Two types
 - ☛ Passive
 - ☛ Active



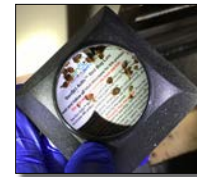
Passive, moat-style interceptor (ClimbUp)



Passive, moat-style DIY interceptor (University of Florida/IFAS Extension)



Active monitor, Includes lure (SenSci Activ Volcano)



23

23

Quick Inspection

- ☛ Staff can conduct quick inspection to confirm infestation before professional comes.
- ☛ Inspect beds and sofas only
 - ☛ focus on easy bed bug signs
- ☛ Faster than detailed inspections
- ☛ Suspicious but no live bed bugs found? *Leave interceptor traps*



24

Professional Inspection

- ✦ Thorough inspection by professional to find harborages
- ✦ Two types
 - Visual – always use a flashlight!
 - Scent detecting canine
- ✦ If found, inspect and place monitors in adjacent units and across the hall



25

Canine inspections

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

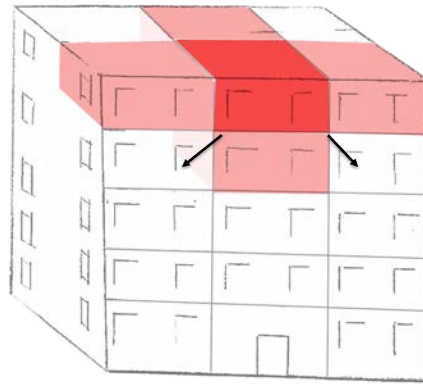
*talk to Karey or Susannah for more information



26

Neighboring units

- All surrounding units should be *inspected*, monitored, and treated if necessary
- Consider diagonal units
- **No routine treatment of units without signs of bed bugs**



27

When someone finds a bed bug

Document all observations

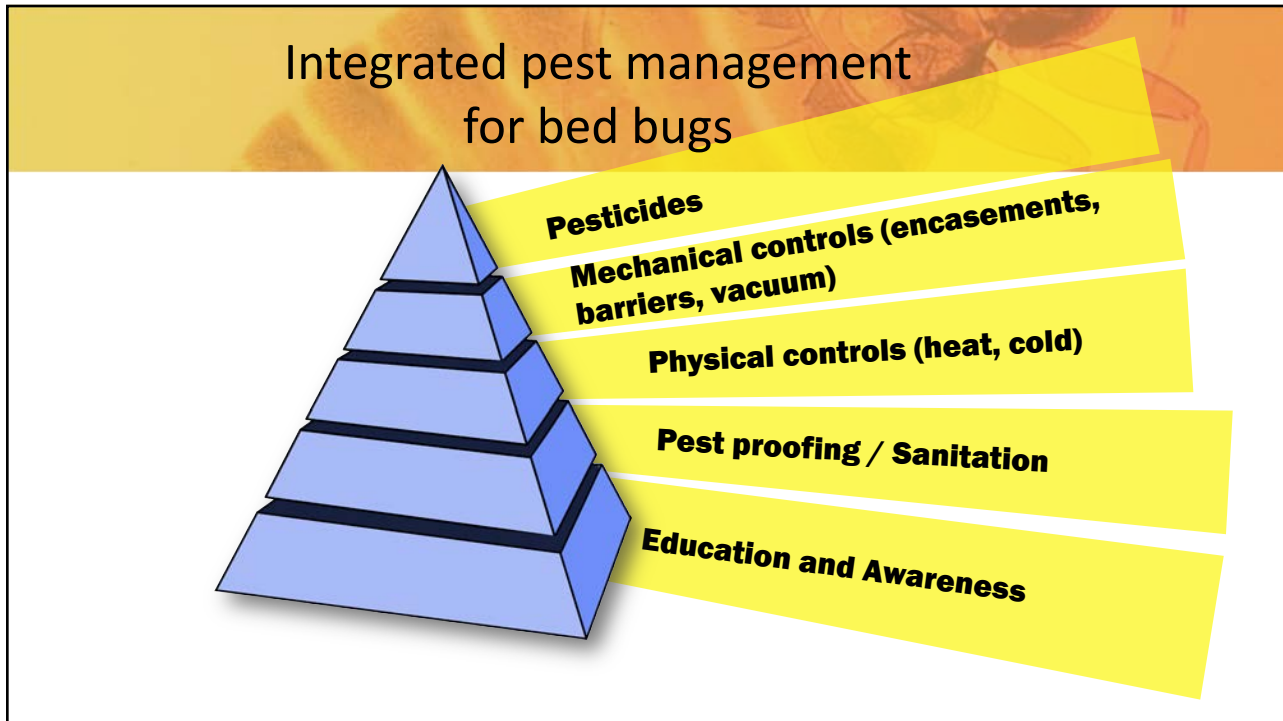
Rapid response plan:

- Save the insect
- Report the problem
- Don't disturb the area
- Don't apply pesticides
- Prevent carrying the bed bugs to other places
- **Don't discard furniture**
- Have the PMP inspect the unit and adjacent units



28

28



29

Education and awareness: Work with tenants

Key Messages:

- ☛ **Inspect, report**
- ☛ **Laundry bedding regularly, and vacuum**
- ☛ **Don't: self-treat, throw out furniture, or pick up discarded furniture**

Classes - Keep it simple

Posters and brochures – help ID and encourage reporting

One-on-one intervention – when needed

*visit stoppests.org and UCIPM for resident materials

Quick Tips
UC IPM

Bed Bugs

Bed bugs are small, wingless insects that feed on blood from humans and other animals.

These insects hide along seams of mattresses, within box springs, or within cracks and crevices in furniture, personal belongings, and areas near sleeping and resting sites. Eliminating an infestation is best done by a professional pest control company and may require removing or treating all infested material and monitoring to be sure bugs are gone.

Bed bug identification and biology.

- Adults are small (about 1/4 inch), flattened, oval, and rusty red. Nymphs (immature stages) are smaller and lighter colored.
- Bed bugs feed only on blood and must have one blood meal prior to molting to the next stage.
- Adults may feed every 5 to 7 days but can survive many months without food.

What are associated health problems?

- Bed bug feeding is usually painless; sleeping victims are typically unaware.
- Areas around bites might redden, swell, and itch several days later. Some people have no reaction.
- Bed bugs aren't known to spread diseases, but scratching bites can lead to infections.

How does a bed bug infestation start?

- People can bring bed bugs into their homes on luggage, clothes, bedding, furniture, or other objects. Bed bugs can be picked up in hotels or other places during overnight visits.
- Hotels, homeless shelters, furnished apartments, and dormitories are most at risk of becoming infested.
- Second-hand mattresses and furniture are known to be high-risk sources of potential bed bug infestations.

For more information about managing pests, visit stoppests.org or contact your local pest control professional.

Detecting bed bugs.

- Using a flashlight and magnifying glass, look for bed bugs, their dark fecal spots, and light-brown shed skins.
- Inspect mattresses, box springs, bed frames, and other areas near sleeping and resting surfaces.
- Bed bugs like to hide. Remove bedding. Look in cracks and holes. Turn furniture upside down and take apart frames if necessary.
- Several kinds of bed bug detection traps are available to help determine if your home is infested.

Use nonchemical methods to get rid of small numbers of bed bugs.

- Vacuum along mattress seams, baseboards, and other bed bug hiding areas.
- Wash all bedding and clothing in hot (120°F) water and dry them using the hottest setting.
- Specially designed mattress encasements are helpful in preventing infestations and sealing bed bugs within so they can't bite.

Serious infestations require professional help and may include insecticide treatments.

- If you rent your home, contact your landlord or property owner so that they can help you manage your infestation. Tenants have rights.
- Hire a reputable pest control company with experience managing bed bugs. They have access to the most effective monitoring techniques and management products.
- Insecticides alone won't control bed bugs. Remove or heat-treat infested materials, and limit hiding spots to prevent future infestations.
- Inspect after treatments to be sure bugs are gone.

What you do in your home and landscape affects our water and health.

- Minimize the use of pesticides that pollute our waterways and harm human health.
- Use nonchemical alternatives or less toxic pesticide products whenever possible.
- Read product labels carefully and follow instructions on proper use, storage, and disposal.

30

30

Work with tenants

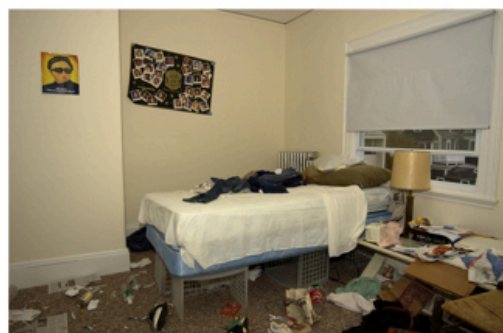
Clutter is the biggest customer-oriented challenge in treating bed bugs
See stoppests.org for resources and training on hoarding intervention



31

Clutter image rating scale found in Compulsive Hoarding and Acquiring Workbook

If preparation is required, communicate expectations to the resident using a visual rating scale



32

32

Consider resident capabilities and preparation options

- ✦ Minimal prep is preferred
 - ✦ avoid moving furniture and bed bugs
 - ✦ low and moderate infestations = less prep
 - ✦ PMP guides customers on how to handle clothing, curtains, etc. ***after first inspection***



33

Who is responsible?

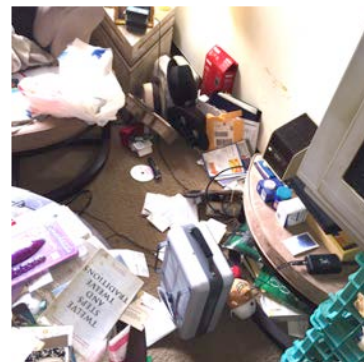
- ✦ Assign realistic preparation responsibilities
 - ✦ Consider disabilities, physical limitations, financial limitations
- ✦ Instructions are ideally carried out by resident

If they are unable

Family & friends
 Building staff
 Aides
 Nonprofit groups
 Contracted companies

If they are unwilling

Penalties? (Non-monetary)
 Fall back on lease



34

Encourage a community response

- Educate everyone
- Destroy discarded items
- PHA could reduce financial burdens by providing
 - mattress encasements
 - monitors
 - proper furniture removal (if needed)



35

35

Management's role: Solve Problems

- Understand your contract and oversee work
- Identify and allocate time and resources to focus areas
- Use renovation and unit turnover as an opportunity
- Monitor and inspect – Is every unit inspected at least once a year?
- Look through service records and work orders for trends and track efficacy



36

Management's role: Find a good contractor and provide oversight

Property managers:

- Review records. Are numbers of pests declining?

PMPs MUST:

- Report monitoring results. How else will we know if treatment worked and the contractor is doing the job?

Both:

- Decide which units need attention (not complaint-based)
- Confirm elimination

The screenshot shows the UC IPM website page for 'Hiring a Pest Control Company'. The page includes a navigation menu, a search bar, and a main content area with the following text:

UC IPM
Statewide Integrated Pest Management Program

UC IPM Home > Homes, Gardens, Landscapes, and Turf > Hiring a Pest Control Company

How to Manage Pests
Pesticide Information

Hiring a Pest Control Company [Download PDF](#)

Published 3/06

In this Guideline:

- Before hiring a company
- After hiring a company
- Checklist for working with a pest control company
- About Pest Notes
- Publication
- Glossary

If you do not have the time or ability to research your pest problem and safely apply the appropriate procedures and materials to control it, you may want to hire a pest control service to do the job for you. A licensed professional also has access to some products not available in retail stores. To be effectively managed, many pest problems, like termites or problems on large trees, require specialized equipment, pesticides, and technical training.

Although professional services may seem costly, the investment may be worth it to solve a serious problem. A pest control professional, who practices integrated pest management methods and keeps up-to-date about the latest technologies, can provide you with the safest and most effective management strategies. If toxic chemicals are part of the pest management method, it is often safer for your family to have them handled by a professional.

BEFORE HIRING A COMPANY

1. Identify the pest and do some research about how to control it following the steps below.

- If you are not certain of the pest's identity, take it to your local University of California (UC) Cooperative Extension office or county agricultural commissioner's office. You can look up their local telephone numbers in your telephone directory. Ask their advice about management solutions.
- Check the online UC Pest Notes for information on managing the pest. Based on this information, determine if management is needed and if it is, whether or not you can safely and effectively address the problem yourself.
- It may be possible for you to make changes in your landscaping or home design to permanently exclude or reduce pests, and this can eliminate the need for professionals, even for serious pests. Examples would be to take out problem tree species and replace them with pest resistant ones or treat your pets with spot-on treatments for fleas and eliminate the need for treating carpets or outdoor areas for fleas.

<http://ipm.ucanr.edu/PMG/PESTNOTES/pn74125.html>

37

Management's role: Know your treatment options

- Vacuuming
- Isolation
 - Encasements
 - Clear bags
 - Closed plastic containers
 - Make the bed an island
- Freezing *not as reliable as heat
 - Chest freezer
- Heat
 - Clothes dryer
 - Steam
 - Container
 - Whole unit
- Pesticides *professionals only!
 - Spray
 - Dust
 - Fumigation



38

38

Mattress encasements

- ☛ Vacuum visible bugs
- ☛ Cover any sharp points
- ☛ Cover mattresses and box springs
 - ☛ Zip, seal, and check for rips
- ☛ Leave it on for 1 year
- ☛ Can eliminate the need to treat mattresses
- ☛ Encases any remaining bed bugs



Use encasements rather than discarding

39

39

Heat

- ☛ Whole unit heat treatment
- ☛ Portable heat chambers
- ☛ Steam — (training needed)
- ☛ Clothes dryers — 30min on high



That's a rug in a dryer!



Building staff at a property in Pennsylvania inside their new ZappBug portable heat chamber.

Consider offering free tokens or one machine designated for *bed bug treatment only*

40

40

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
- ☛ Slow!

41

Only PMPs use sprays

- ☛ **Not effective** when used by tenants
- ☛ Over-the-counter-sprays and foggers cause bugs to **scatter** away from the professional's treatment



42

42

The PMP's role

- ✦ ALWAYS thoroughly inspects reporting unit and adjacent areas
- ✦ Provides site-specific preparation guidelines
- ✦ Returns to inspect every two weeks
 - ✦ treat if bed bugs found
 - ✦ follows-up until bed bugs not found for two to three consecutive visits



43

43

PMP's role: Applies pesticides

- ✦ Only PMPs should use pesticides
- ✦ Types of formulations
 - ✦ Aerosols
 - ✦ Dusts
 - ✦ Fumigants
 - ✦ Sprays

The label is the law!



44

Understanding chemical treatments

- ☒ No silver bullet
- ☒ Pesticide sprays have
 - ☒ limited residual effect
 - ☒ Some only work on contact
- ☒ Most effective chemicals
 - ☒ combination products (neonicotinoids + pyrethroids)
- ☒ Dusts effective if kept dry

* Ask your StopPests or UC IPM for advice on product efficacy



45

45

PMP's Role: Mix it up

- ☒ Heat - steam, chamber
 - ☒ With optional residual insecticides
- ☒ Pesticide-based
 - ☒ Barriers
 - ☒ Dusts
 - ☒ Residual sprays
- ☒ Vacuum and encasements – all treatments



46

Module Review (Workplan)

What will you do now?

Who does what?

- ☒ Education
- ☒ Monitoring
- ☒ Preparation
- ☒ Laundry
- ☒ Encasements
- ☒ Visual inspection
- ☒ Furniture removal
- ☒ Review records

Contract/Policy requirements

- ☒ Monitors all or high-risk units
- ☒ Inspect neighboring units
- ☒ Assessment-based Prep Instructions
- ☒ Use of:
 - ☒ Steam
 - ☒ Heat
 - ☒ Sprays
 - ☒ Dusts
 - ☒ Vacuum
- ☒ Follow-up treatment/schedule based on monitoring every 2 weeks
- ☒ Confirm elimination

47

47

Audience questions?

The screenshot shows the StopPests.org website interface. At the top left is the 'STOP Pests in housing' logo. The main navigation bar includes 'Webinars', 'Request Training', and 'Past Solutions'. A search bar is also present. The central content area features a 'News You Can Use' section with a date of March 25, 2020, and a headline about pest control operations during the COVID-19 outbreak. Below this are sections for 'ABOUT US', 'WHAT IS IPM?', 'WORKING WITH RESIDENTS', and 'IPM TRAINING'. At the bottom, there are 'SUCCESS STORIES' and 'Training RSS', 'Funding RSS', and 'Blog RSS' buttons. On the right side, there is a 'HOME' section with 'ON THIS SITE' and 'Home, garden, turf, and landscape pests' information. A large, semi-transparent question mark is overlaid on the bottom right of the screenshot, with the text 'Use chat feature! Visit StopPests.org & ipm.ucanr.edu'.

48

Poll

Will the information you got from this training improve how you deal with bed bugs at work?

49

Contact us!

Susannah Reese

sck27@cornell.edu

(607) 254-8990

StopPests.org

Karey Windbiel-Rojas

Associate Director for Urban & Community IPM/ Area IPM
Advisor

UC^{ANR}: Integrated Pest Management

(530) 750-1241

kwindbiel@ucanr.edu

<http://ipm.ucanr.edu/>



50