



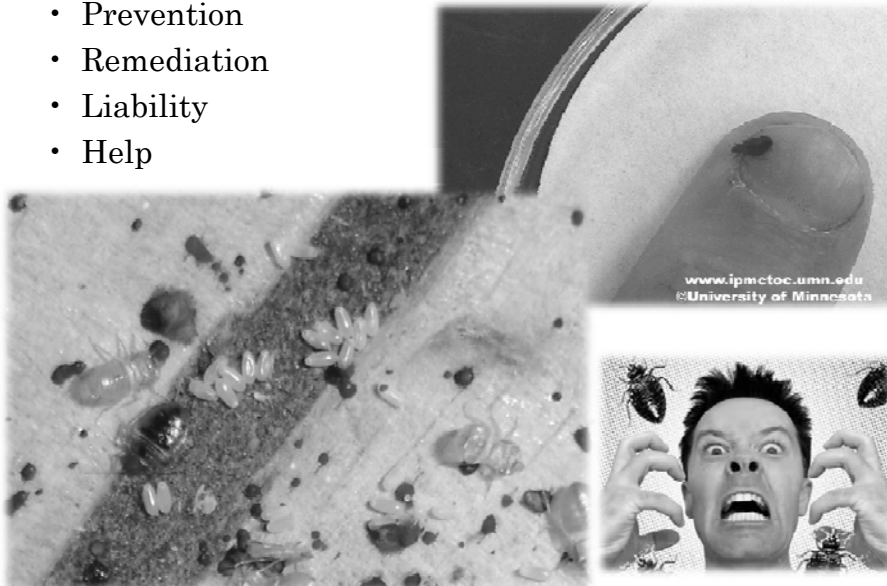
IF THE BED BUGS BITE, BITE THEM

**DAWN H. GOUGE
UNIVERSITY OF ARIZONA**

BACK!

BED BUGS ADVANCED

- Prevention
- Remediation
- Liability
- Help



PHA Prevention

Residents will monitor homes, they have to be able to report problems.



Aside from potential health concerns, bed bugs spark complaints and lead to long-term reputation damage.

Bed bugs are not an indicator of poor sanitation, but are unacceptable pests.

It is prudent to develop a proactive plan to address them when they occur

Train staff to monitor for bed bugs as part of their daily routine

Establish protocols for turn-over of bed bug infested homes

Aggressive policies to control bed bugs as soon as they are discovered

Disclosing procedures and practices helps to alleviate fear for residents



In long-term residential facilities, preventing bed bugs from entering on residents' personal effects is the best way to lower the potential for an infestation.

- Check mattresses** – Conduct a visual inspection of bedding as it is brought in

- Require mattress and box springs to be encased** – A synthetic covering on



mattresses and especially box springs prevents bed bugs from escape and access to food sources.

Reserve the right to refuse infested belongings

- Perform an inspection of incoming furniture** – Much like bedding, other furniture can easily harbor bed bugs.

- Utilize monitoring technology** – A number of options are available

- Bed bug-sniffing dogs** – Trained dogs are among the most effective detectors of bed bugs.



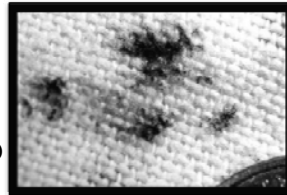
Encase

- Mattress
- Pillows
- Most importantly the box-spring
- Medical beds are problematic
 - Trap live bed bugs inside
 - Zip, seal, and check for rips.
 - Leave it on for 1-1/2 years (don't let it rip)
 - Costly \$126 for King size mattress

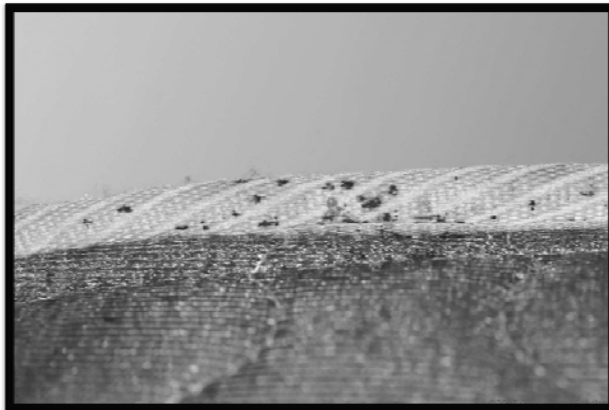


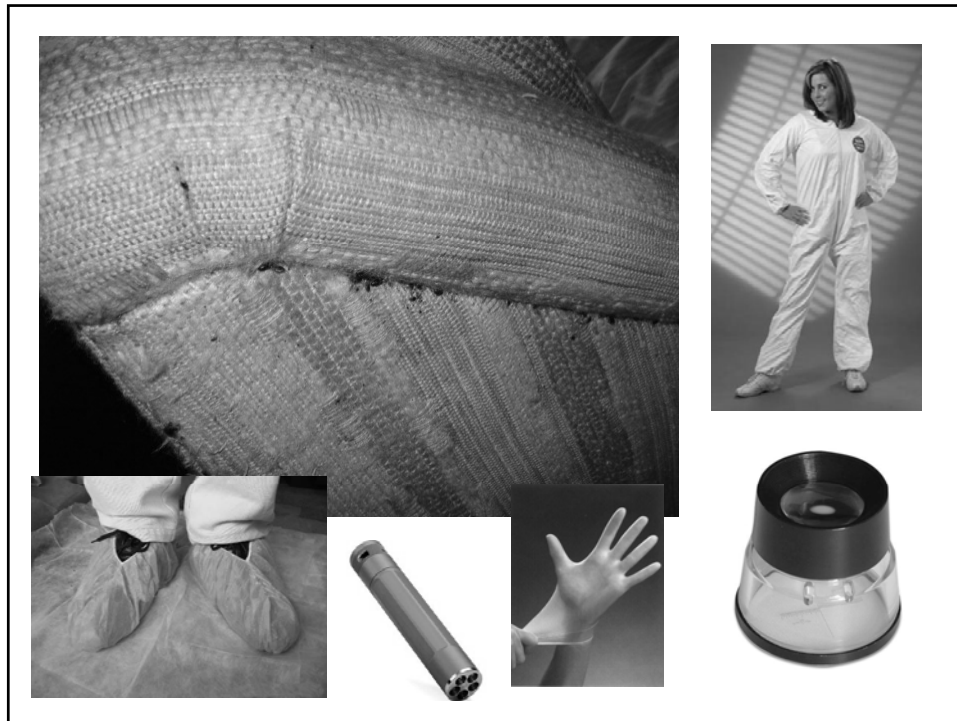
Inspection

- Protocol
- Train staff to recognize signs
- Flashlight and magnification loop
- Personal Protective Equipment



- Bites
- Bugs
- Blood stains
- Cast skins





- **Weekly – Monitor for evidence when changing sheets. Check the mattress cover and the edges of the mattress. Inspect the box springs.**
- **After move-in home inspection – Conduct thorough inspections of potential harborage locations – behind pictures, headboards, in furniture.**

Most bed bugs (60-75%) will be associated with the bed



- Depending upon the level of infestation it's likely rooms/homes either side, above and below are also infested.



School Policy Recommendations

- Have a response plan
 - Establish a school IPM Plan
 - Train staff to identify bed bugs and the signs of bed bugs in the classroom and the children's items.
 - Any student with bed bugs identified on their person or in their belongings may remain in school until the end of the day.
 - Respond promptly to bed bug complaints within the school and through contact and counseling with parents.
 - Parents should promptly respond to bed bugs in the home for the health and safety of the family and school community.



- **Have a procedure plan**
 - **Child visits school nurse**
 - **Bugs kept for ID**
 - **Notify the affected class or classes.**
 - **Parents should receive educational materials along with a notification letter**
 - **Inspect and monitor classrooms: crevices in baseboards, pictures furniture, window, and door casings, wallpaper, behind electrical switch plates, in telephones, radios, clocks, behind wall mounted art-work.**



- **In most instances students should not be excluded from school**
- **Schools should not be closed**
- **For children who repeatedly come to school with bed bugs, institute clothing and school item sanitation.**
- **In an infested home, parents should store their child's freshly laundered clothing in sealed plastic bags until they are put on in the morning.**
- **Backpacks, lunchboxes and other items that travel back and forth to school can also be inspected daily and stored in sealed plastic containers.**



•At school the student could be provided with plastic bags or bins in which to store their belongings in



•The unusual instance where a child repeatedly reports to school showing evidence of bed bugs despite previous notification, education and counseling with parents, further investigation is needed.

•Investigate other sources of bed bugs on school property such as lockers, buses, common areas or other areas where students routinely congregate.

Remediation

- Protocol
- Sanitation
- Heat and cold treatments
- Pesticides



- Dispose - increases the chances of eradication
- Launder –wash in hot water with detergent and dry on high heat for 40 minutes once dry. Dry-clean
- Heat – Pest management professionals use special equipment to heat the room to >140°F. Client's belongings (PackTite). Use dry steam on carpet, mattress edges and cushioned furniture.
- Freeze – Pest management professionals use special equipment to freeze





•Fumigate – pesticides kill all pests and leave no residual. Requires the facility to be completely vacated (re-house residents).

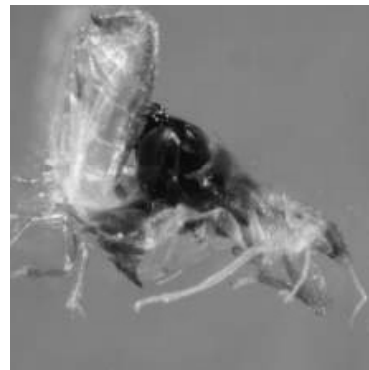
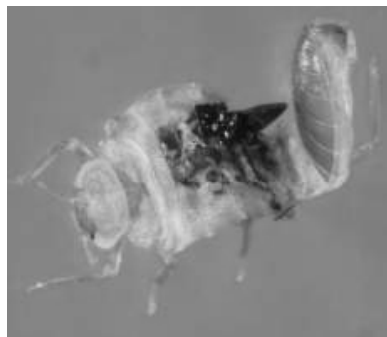


- **Non-residual Chemical Treatments – Alcohol will kills bed bugs and can be used to clean hard surfaces**



- **Residual Non-repellent Chemical Treatments – Chemically treat cracks and crevices, carpet edges, baseboards, furniture, headboards, etc.**

- **Bed bugs can be resistant to certain pesticides.**
- **Insect Growth Regulators, or IGRs, appear to be only partially effective.**



Some pesticides labeled to control bed bugs:

- Allethrin
- Bedlam
- Delta Dust - 0.05% (deltamethrin)
- Pyrethrins
- Resmethrin - 0.3% spray
- Suspend SC - 0.6% spray
- Drione Dust
- Perma-Guard
- Tri-Die
- Flee/Dragnet FT - 0.5% spray
- Malathion 57% EL - 4 table spoons per gal. of non-odor kerosene
- Tempo 2 - 0.05 - 0.1% spray
- Tempo 0.1% dust
- Tempo 20 WP
- Phantom aerosol (chlorfenapyr)
- Temprid (imidacloprid & cyfluthrin)

>500 products

Significant resistance to some

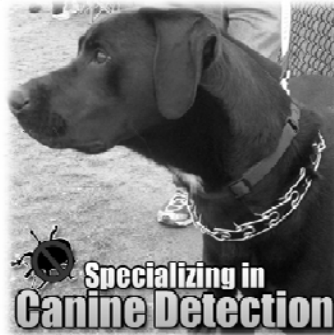
Crack and crevice - drying + residual

DIRECT SPRAY RESULTS: FIELD STRAIN

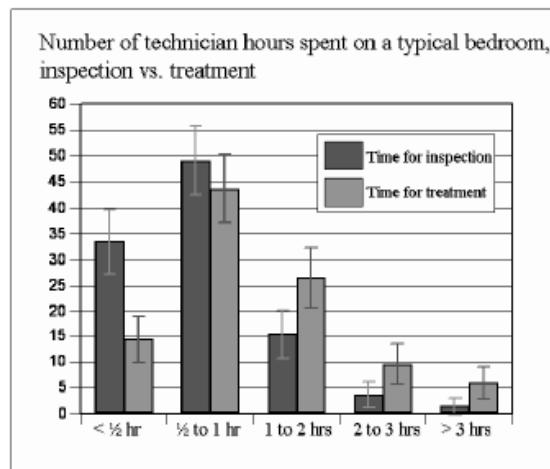
Treatment	N	LT ₅₀ (Hours)	95% CIs	Slope ± SE
Suspend SC	50	99.6 h	67.3 – 153.2	1.5 ± 0.1
Kicker	50	> 14 d		
Suspend + Kicker	50	15.9 h	10.7 – 24.9	1.1 ± 0.1
Tempo SC Ultra	50	123.3 h	109.7 – 137.2	4.1 ± 0.3

Field strain is resistant to direct spray but mortality does occur. It just takes longer.
 Dr. Dini Miller, VA Tech. Field Tests 2007-09

A JOB FOR THE PROFESSIONALS

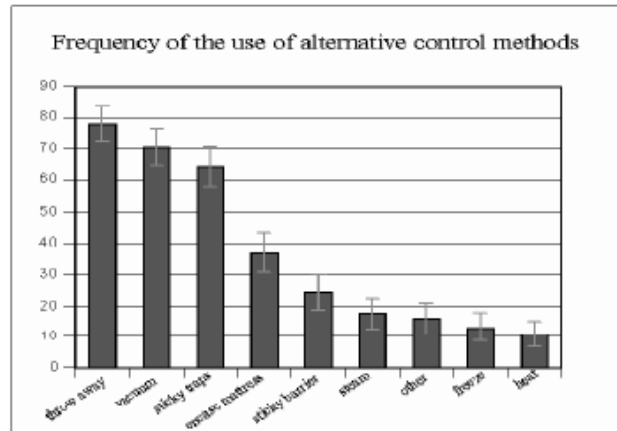


BED BUGS PEST MGT. INDUSTRY SURVEY



Gangloff-Kaufmann et al. study. Am Entomol. Summer 2006.

BED BUGS PEST MGT. INDUSTRY SURVEY



Throwaway
Vacuum
Sticky traps
Encase mattress
Sticky barrier
Steam
Other
Freeze
Heat


Gangloff-Kaufmann et al. study. Am Entomol. Summer 2006.


“Bed Bugs Easily Most Difficult & Most Expensive Pests in Apartments”

- Pest management companies may charge from \$200-\$1,000 per unit for initial service; AZ \$500 / room, pesticide treatment.
- Not unusual for apartment complex of 200-500 units spending \$20,000-\$50,000 to eliminate bed bug infestations;
- Multi-dwellings face financial hardships, liability costs, lawsuits, and adverse public relations from bed bug infestations.




Source: Bed Bug Handbook Pinto et al. 2007





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- WHY GO EXTREME
- BED BUG INFO
- PICTURES & VIDEOS
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Our Services at a Glance

[Bed Bug Treatment/Prevention](#)

Bed bugs prosper in clutter. The clutter is usually ignored as the treatment area. We help you identify clutter in your bed, near the perimeter, in your kitchen, near your furniture, and remove it and/or bag it. Our service is the foundation for a successful bed bug treatment. [Click here](#) to read more about our bed bug treatment preparation strategy.

[Bed Bug Infested Mattress Removal](#)

Remove the problem at the source. A severe bed bug infestation can render infested furniture unusable. Our team will use appropriate methods to remove your infested mattresses and other furniture to ensure the problem is not allowed to spread. [Click here](#) to read more about our bed bug infested mattress removal procedure.



[Hoarding Cleanup](#)

We understand that hoarding is a serious and potentially disabling mental disorder. Successful amounts of clutter in the home present long standing problems and impediments for the client's development and well-being. We have an extensive working ground for items such as tools, toys, electronics, and bed bugs. We offer a safe and professional hoarding home. [Click here](#) to see how Extreme Cleanup can take care of any hoarding situation.

[Bed Bug Infested Laundry Services](#)

Bed bugs commonly live and hide in and amongst our clothing. Extreme Cleanup Inc. will pickup, wash, dry, and deliver your bed bug infested laundry to ensure your clothing is free of bed bugs. [Click here](#) to find out more about our bed bug infested laundry services.

[Bed Bug Exclusion Services](#)

Bed bugs commonly spread to other apartments through cracks, crevices, and gaps in the structure of the building. Our bed bug exclusion services will seal off these cracks, crevices, and gaps and stop the spread of the bed bug. [Click here](#) to find out more about our bed bug exclusion services that help you exclude in the first place bed bugs.

[Cleaning, Sanitization, and Deodorization](#)

Our cleaning services are specifically designed to help improve the effectiveness of bed control bed bug treatments. A deep enzymatic steam bed bug treatment spray is used with maximum efficiency. It also eliminates sources of food for certain pests. We provide sanitary living conditions for those who cannot properly care for themselves. [Click here](#) to read more about our Cleaning, Sanitizing, and Deodorizing services.

[General Junk Removal](#)

Let Extreme Cleanup take out the trash. We are a full service residential junk removal company and can help declutter your life. Furniture, appliances, electronics, and all other clutter is safely removed by our employees and donated to charity. After removal and cleanup, we will responsibly dispose of your junk in an ecologically friendly manner. [Click here](#) for our junk removal procedures and prices.



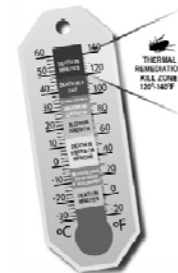
© Extreme Termite & Pest Control





Summary

- Sanitation (vacuuming, etc.),
- Hygiene (laundry, steaming),
- Cultural proactive practices, (maintenance, monitoring, encasing, sealing, pest proofing, etc.),
- Residual (non-repellent) pesticides,
- Heat / freeze treatments, etc.
- Fumigation.



Phantom® Aerosol

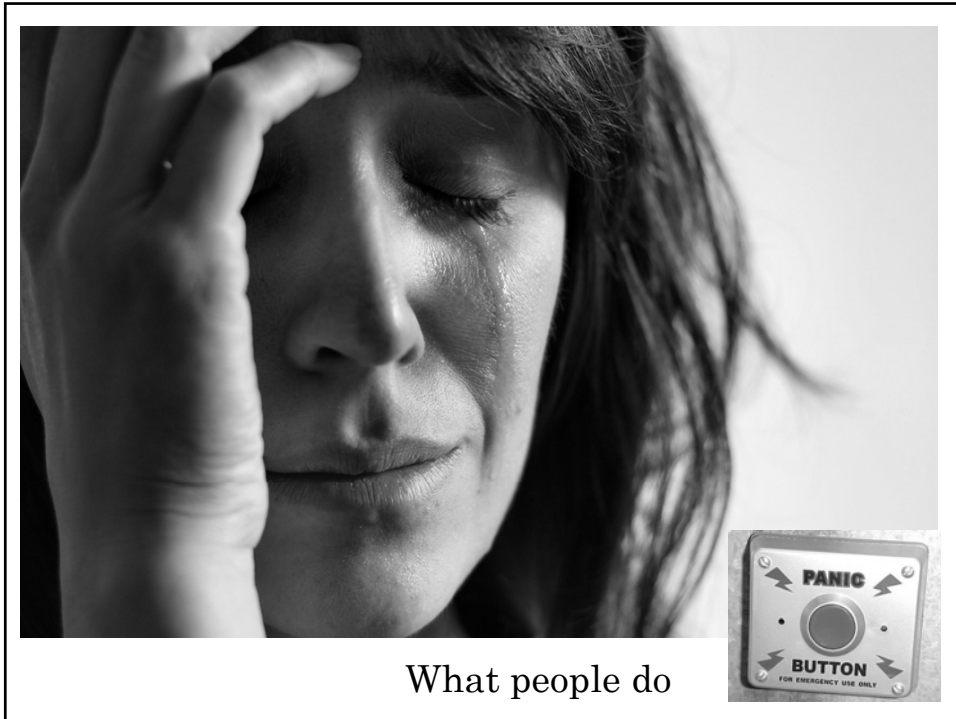
EVOLUTION
in better pest control

Revenge feels good!

Watch your bed bugs die with...

PackTite
Portable Bed Bug Heater
De-bug all your non-washable items!!

FREE SHIPPING at USBedBugs.com



MISIDENTIFY

- Ticks
- Cockroach nymphs
- Other kinds of bug bites



Tick



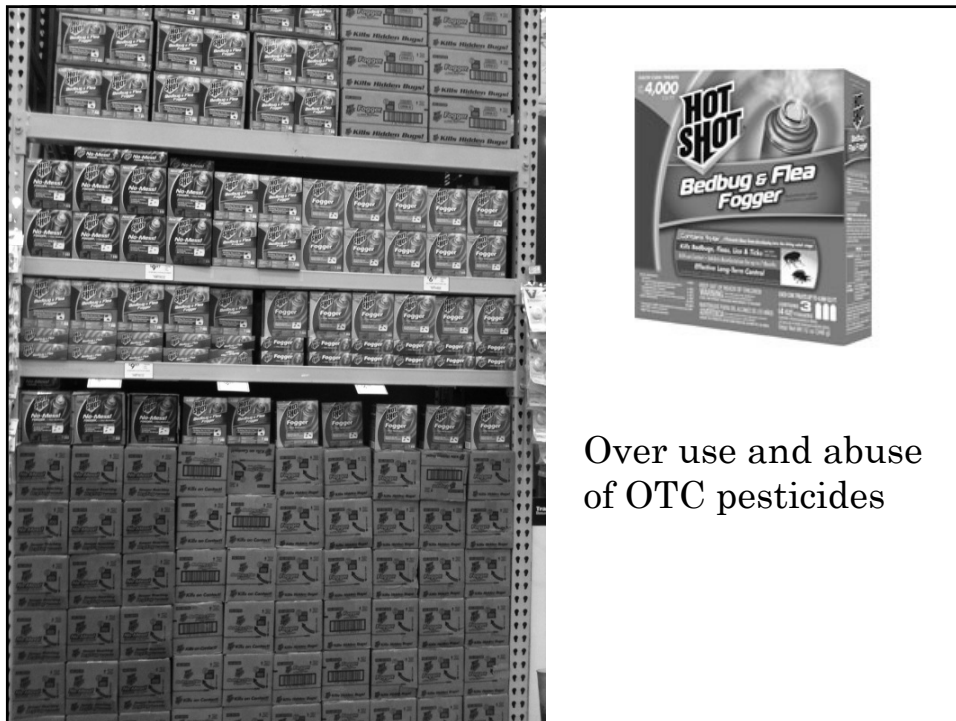
Mosquito Bites



Cockroach Nymph



Bat Bug



Over use and abuse of OTC pesticides



TOTAL RELEASE FOGGERS (THERE'S A REASON THEY'RE CALLED BOMBS!)





HOW TO HANDLE ILLEGAL AND RISKY PESTICIDES



Unlabeled Mothballs Chinese Chalk Tres Pasitos

Products without a pesticide label are illegal

- Educate staff and clients on the dangers of using illegal pesticides
- Report illegal sales to the EPA or to the state pesticide licensing agency
- Staff should be cautious, ask questions, avoid exposure to pesticide treated items.



Bed Bug Legislation Introduced in Arizona HB2210 - Jan 2010

Only licensed applicators permitted to treat for bed bugs in multifamily housing

Tenants required to notify landlord if they detect bed bugs, and permit the landlord or licensed pest control operator access to the unit to conduct an inspection and perform mitigation activities.

Local governments would be precluded from enacting legislation or regulations pertaining to the management of bed bugs in multifamily housing



Failed to pass the Arizona Senate before the Legislature adjourned the 2010 Regular Session in late April.

A 2010 search of the EPA database for all active products that are registered for indoor use and for bed bugs actually revealed a total of 504 products.

Bed Bug Insecticide Lists:

<http://ento.psu.edu/extension/factsheets/bedbugs>

<http://lancaster.unl.edu/pest/Resources/BedBug263.shtml>

<http://www.techletter.com/Archive/Technical%20Articles/bedbuginsecticides.html>

<http://www.bedbuginfo.com/bed-bug-insecticides.php#>

<http://www.bedbuginfo.com/bed-bug-insecticides.php#>

LAWSUITS

- NYC >2000 summonses in 2006
- The questions:
 - Did the responsible know they had an infestation?
 - Should they have known?
 - Was there a prevention program in place?
- Claims:
 - Damage
 - Injury (bites)
 - Emotional stress



- 2003- \$382,000 punitive and compensatory damages awarded to two Chicago plaintiffs
- 2004- 45% rent abatement for six-months to a New York apartment tenant
- 2007- A woman is claiming infestation by hundreds of bed bugs in a cheap motel during her recuperation from breast cancer
- 2007-Plaintiffs claimed that bed bug pesticide spraying at Wichita State University made them ill
- 2008-Three apartment tenants in Chicago claim for bedbug injuries
- Australian tourism industry \$75 million yearly
- 2008-An opera singer initiated a lawsuit against the Hilton Corporation for \$6 million



>500 bedbug bites at the hotel

2006, Leslie Fox - 20 million \$s, awarded 6 million \$s

MEDICAL PROFESSIONALS

April 2009, Journal of American Medicine,
Jerome Goddard, Ph.D., Mississippi State
University, and Richard deShazo, M.D.,
University of Mississippi Medical Center,
reviewed 53 published articles on bed bugs.

Conclude that bed bugs do not transmit
communicable diseases, translating into little to
no serious health risks to humans.

Bed bug bites can be a source of serious irritation.
Lack of an effective treatment for the bites, which
cause minor to complex skin reactions and, in
rare cases, systemic reactions.

Treatments:

- antibiotics
- topical corticosteroids
- epinephrine



What should we be doing?

- Create a State Taskforce
 - Work on legislative initiatives
 - Educate residents on bed bugs
 - Connect residents with experienced professionals
 - Develop supportive management protocols for: schools, hospitals, shelters, PHAs, apartment managers, etc.



BED BUG RESOURCES



- **EPA Public Health Pests PRN** at http://www.epa.gov/opppmsd1/PR_Notices/pr2002-1.pdf
- **Bed Bug Mgt. in Residences – Info for Pest Control Companies** at [http://www.ipmctoc.umn.edu/Control of bedbugs in residences US Commercial.pdf](http://www.ipmctoc.umn.edu/Control_of_bedbugs_in_residences_US_Commercial.pdf)
- **Bed Bug Management Cornell Guide** at http://www.nysipm.cornell.edu/publications/bb_guidelines/files/bb_guidelines_nyc2.pdf
- **Ohio Bed Bug Taskforce** at <http://centralohiobedbugs.org/>
- **Bed Bug Central for PMPs** at <http://www.bedbugcentral.com/>
- **Bed Bug Resources NPIC** at <http://npic.orst.edu/pest/bedbug.html>
- <http://www.hospitalmold.com/bed-bugs-in-medical-facilities.htm>



Slides from the Following People
Contributed to this Presentation:

- Dr. Dini Miller, VA Tech.
- Dr. Susan Jones, Ohio State Univ.
- Dr. Harold Harlan, Armed Forces Pest Mgt. Bd.
- Kimberly Nesci, EPA OPP



Well, good night, sleep tight, and don't let the bed bugs bite.

