

US EPA ARCHIVE DOCUMENT



Controlling Bed Bugs In School Environments



PRESENTERS



- **Dr. Dini M. Miller** is a Professor at the Virginia Tech University, and the Urban Pest Management Specialist for the state of Virginia. Dr. Miller is an internationally recognized expert in the area of urban pest management, particularly bed bug biology, behavior and control. She has produced a number of bed bug action plans for the management of infestations in different environments, including schools. Dr. Miller received her Masters and Ph.D. degrees at the University of Florida in Urban Entomology.



- **Susan Jennings** is the Public Health Liaison for EPA's Office of Pesticide Programs. As the Public Health Liaison, Susan is the Office's primary contact for public health issues involving pesticides. She facilitates and encourages input from public health interest groups, other federal, state and local government agencies and the regulated industry. Susan leads EPA's efforts to address the bed bug situation.
- **Dr. Marcia Anderson** is with EPA's SIPM Center of Expertise for School IPM. She holds a PhD in Environmental Management from Montclair State University and a Master's in Teaching and Curriculum Earth Science. Marcia, was formerly with the EPA Region 2 Pesticides Program, and was the R2 Bed Bug Coordinator. She was also a professor of Earth and Environmental Studies, at several NJ universities.





Controlling Bed Bugs In School Environments



Center of Expertise for School IPM



BED BUGS GO TO SCHOOL

Two NJ schools are sprayed with pesticide due to the sighting of one bed bug. No timely notice was given to parents. Oct. 11, 2011

"Bedbugs are invading classrooms at alarming rate" ("It was, like, 'OMG, there's bedbugs in the school,'")-NYC, NY - Nov. 5, 2010

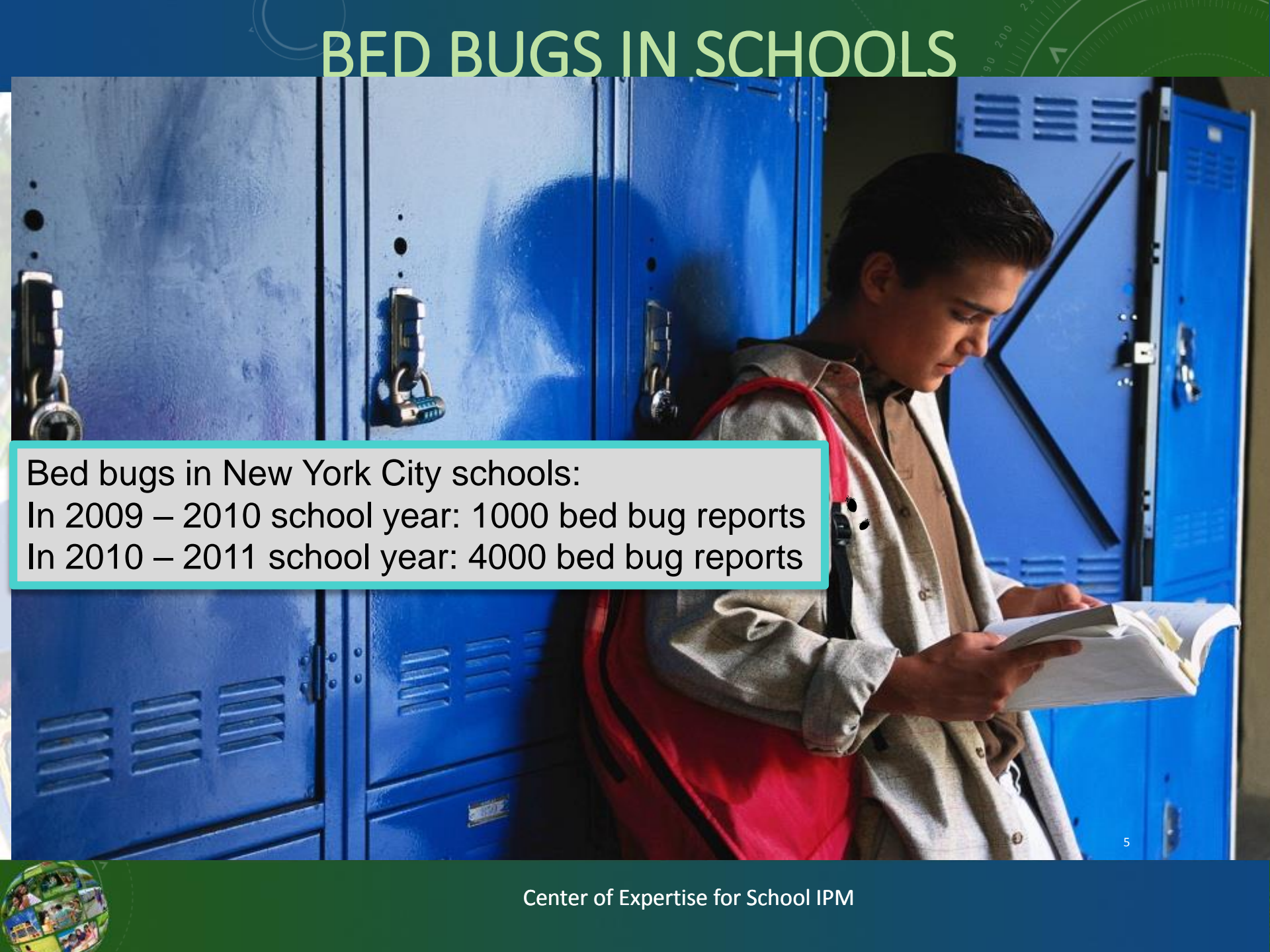


"Kentucky school bans backpacks and lunch boxes after bedbugs appear..." -Sept. 7, 2010

"Bedbugs are sighted at a Jersey City School and officials stated they will confine them to the 3rd floor and not close the school despite outside pressure" -Dec. 20, 2010



BED BUGS IN SCHOOLS

A young man with dark hair, wearing a grey button-down shirt and a red backpack, is standing in a school locker room. He is looking down at an open book or folder he is holding. The background consists of blue metal lockers with silver handles and combination locks. The lighting is bright, casting shadows on the lockers.

Bed bugs in New York City schools:
In 2009 – 2010 school year: 1000 bed bug reports
In 2010 – 2011 school year: 4000 bed bug reports



BED BUG “FEAR AND LOATHING”



- **Why are bed bugs such a challenge?**
The issue of bed bugs in a school can be emotional and generate anxiety in parents, students and school staff.



Panic & Hysteria...
Don't let it happen in your school!



THINGS TO AVOID:

- Overreacting.
- Closing the school.
- Sending a student home.
- Stigmatizing students.
- Allowing staff to apply pesticides (unless they are state certified applicators).
- Widespread pesticide applications are not necessary.



HOW CAN SCHOOLS BE PROACTIVE?

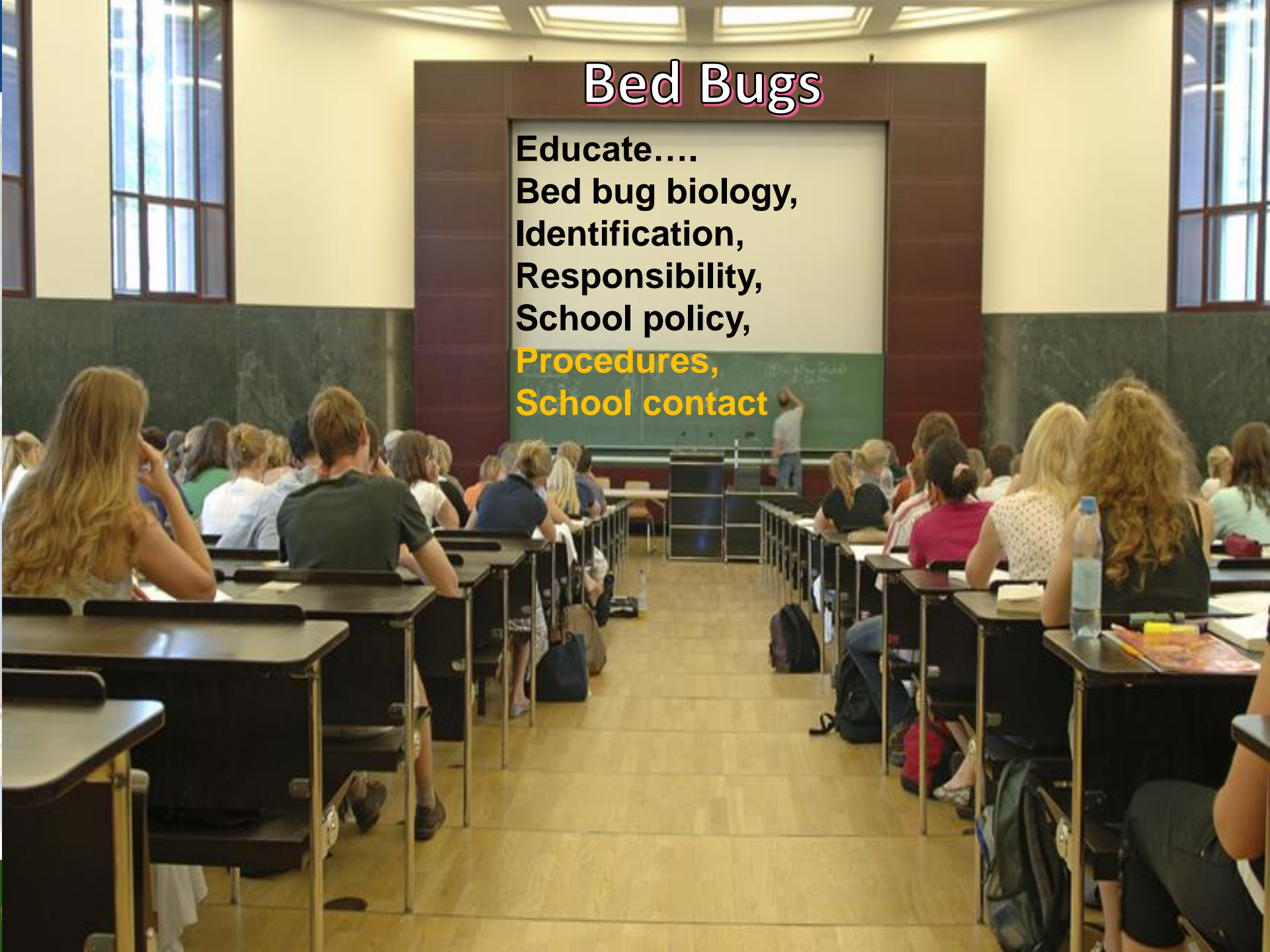
The formula for success in dealing with bed bugs is to educate everyone.



- Have a plan of action.
- Follow this bed bug management approach.
 1. **Plan to remain calm.**
 2. Develop policies at the school district level.
 3. Develop procedures and staff responsibilities.
 4. Educate all stakeholders.

Bed Bugs

Educate....
Bed bug biology,
Identification,
Responsibility,
School policy,
Procedures,
School contact



CAN YOU IDENTIFY THE BED BUG?



1 Tick



2 Tick



3 Bed Bug nymph



4 Carpet Beetle



5 Cockroach



6 Adult Bed bug



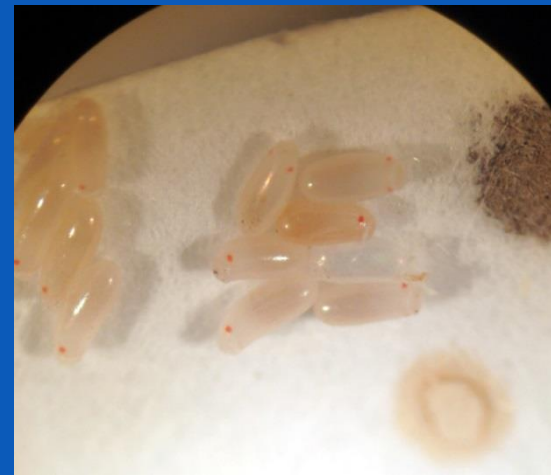
7 Cockroach nymph

EDUCATION FOR ALL EMPLOYEES



EDUCATION FOR ALL EMPLOYEES

- Know them when you see them!



What are Bed Bugs?

- Family Cimicidae
- 35,000 years ago lived in caves and were ecto-parasites of bats
- When humans moved into the caves bed bugs fed on humans
- Humans have since transported bed bugs all over the world



Piercing-sucking mouthparts

PHYSICAL ID

- Oval Bodied, $< \frac{1}{4}$ inch.
- Adults: brown to red in color
- Wingless – they do not jump
- Six legs
- Nymphs are nearly colorless
 - Size of a poppy seed
- Eggs are white, 1-2mm
- Eggs glued to rough surfaces



COMMON BED BUG MYTHS

**You can't see
bed bugs with
the naked eye.**

Although they are
tiny, adult bed bugs
are easy to see.

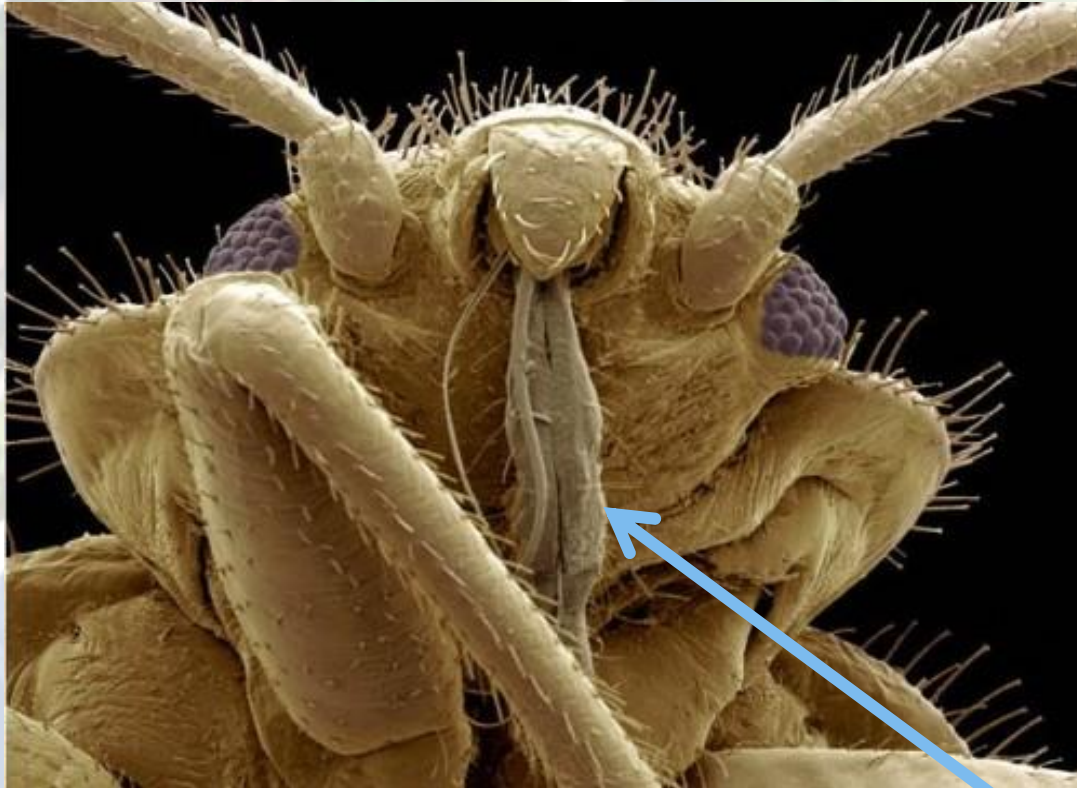


You should be able to see adult bed bugs.

- Adults are a little smaller than an apple seed.
- 1st instar nymph is about the size of a period at end of sentence.



HOW DO BED BUGS FEED?



- **Bed bugs have piercing-sucking mouth parts.**
- **Penetrate skin with beak and inject an anticoagulant.**



BED BUG FEEDING



Flattened from top to bottom

1. hungry



2. feeding

Penetrate skin with beak and drink blood.



3. full

In 10 Minutes!



BED BUG CHARACTERISTICS

- Typically aggregate.
- Usually active at night but will adjust to your schedule
- Increased concentration of CO₂ the room stimulates them to begin searching
- Will travel many yards to feed.
- Active between within hours of the beginning of the dark phase (based on your schedule)



COMMON BED BUG MYTHS

Are bed bugs only active at night?

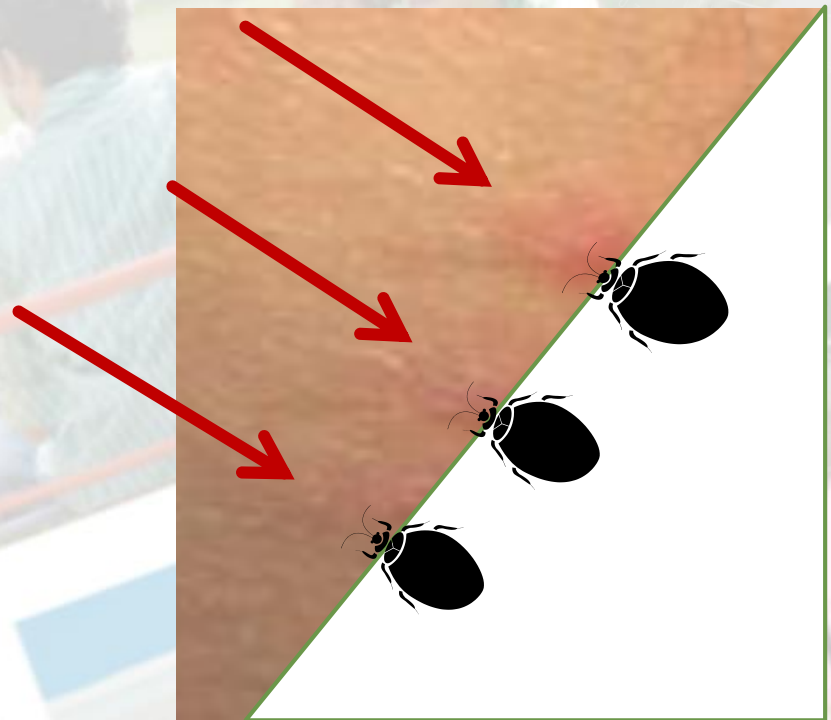
- While bed bugs prefer darkness, keeping the light on at night won't deter them from biting.
- They are most active at night but their activity period can vary.



COMMON BED BUG MYTHS

Can bed bug bites be identified by professionals because they often show up in sets of three in a row: “breakfast, lunch, and dinner”?

- Bed Bug Bites
- Don't burrow under skin like ticks.
- Professionals cannot identify bed bug infestations by the bites alone.



Bed Bug Bites

- Bed bugs have to be brought in
- First indicator is **multiple** unexplained itching red welts
- No disease transmission!
- Bites suggest bed bugs but are not definitive
- Medical doctors are terrible about diagnosing bites!



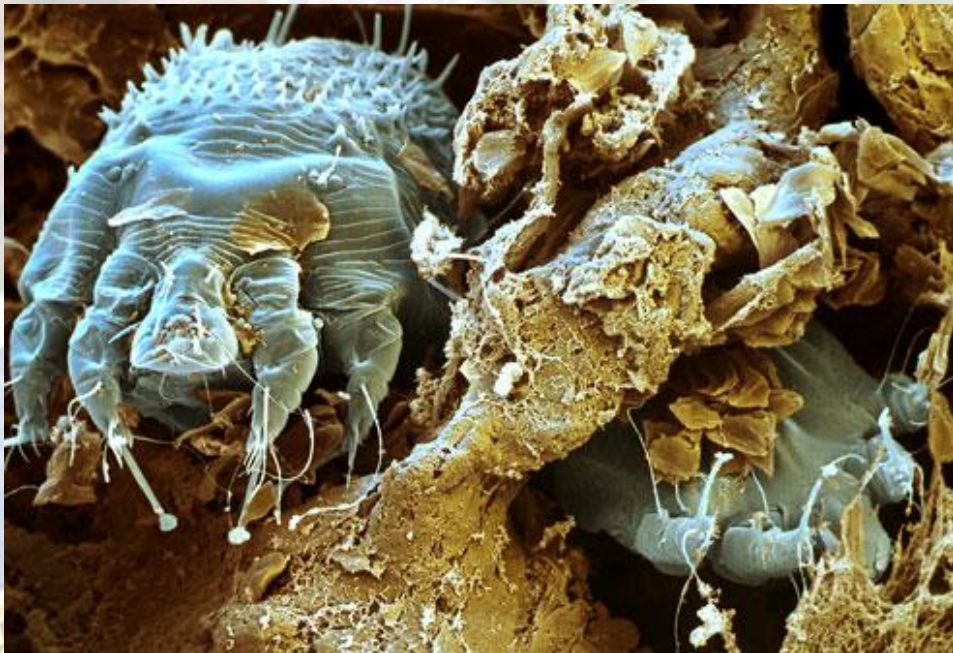
Bed bugs take multiple bites when searching for a capillary space

Bite Reactions are Highly Variable

- My technician's arm one week after feeding **1000s** of bed bugs.
- My arm one week after feeding **60** 2-3rd instar bed bugs.
- My student's **arm** **1 year** after feeding mixed stage bed bugs.



OTHER PEST PROBLEMS OFTEN CONFUSED WITH BED BUGS...

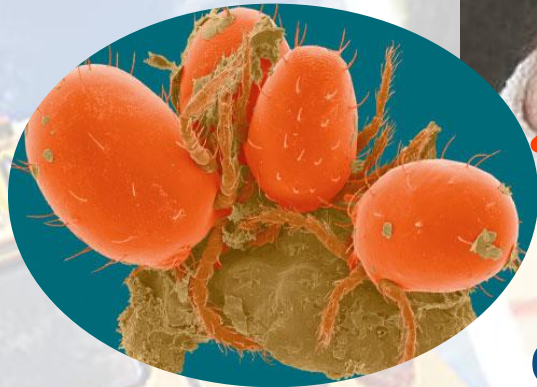


- Scabies is a condition where mites burrow into the skin resulting in lesions and open sores.



OTHER PESTS CONFUSED WITH BED BUGS...

- Fleas
- Chiggers
- Bird mites
- Rodent mites



Chiggers above
Fleas right



HOW TO RESPOND

**What are the first things you should you do if you think you see a bed bug?
(Select all that apply)**

a) Scream!



b) Call the facility manager



c) Inspect the area near where the bb was found

d) Close school for the rest of the day

e) Call a Pest Control Company immediately



f) Capture it for proper ID

g) Kill it and forget it, because it is only one



h) Notify the school nurse



CODE OF PRACTICE

When a Bed Bug is Found...

- Decide how to respond to a single bed bug found on a child.
- Decide how to respond to one or more bed bugs are found in a classroom.
- Have a code of practice in place for both situations.
- Communicate this code of practice to all faculty and staff.



Introduction Versus Infestation

- Introduction- a single bug or a group of bugs that are not breeding
 - A single or multiple immature bugs
 - A single or multiple male bugs
- Infestation- a reproducing population
 - Can be a single mated adult female
 - Eggs present



Introduction- on a student backpack



Infestation- In the Classroom

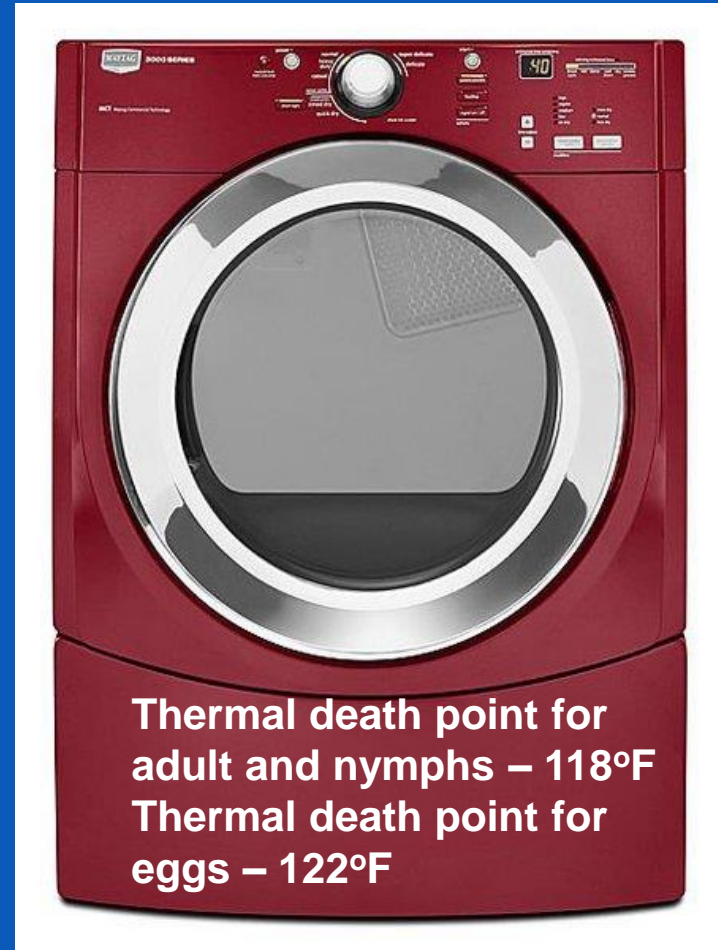
Bed Bugs on a Student

- Bed bug is found on a student's shirt or backpack.
- Capture the bug!
 - Lint remover sheets, extra sticky.
 - Identify the bug.
- Who is in charge?
- Have a plan.
- No freaking out!



Bed Bugs On A Student (Introduction)

- Purchase a household dryer with a shelf.
- Have a change of clothing for the student.
- Put belongings in the dryer.
- 30 minutes on high heat.
- Your problem solved for the moment....



Students Have Bed Bugs At Home!



What Next?

- Alert the child's parents about the bed bugs.
 - No doubt they already know.
- Are they having the infestation treated?
- Does it make any difference?
 - Some infestations may take months to get under control.
- Long term plan for the student?
- How involved can you afford to be in home infestations?
 - 2 students?
 - 10 students?



Bed Bug(s) Found in a Classroom

- Isolate the location in the room where it was found.
- Collect it.
- Identify it.
- Call your pest management company and have them inspect.
- Determine if parents must be notified.



CLASSROOM INFESTATIONS



- Decide how to respond to a bed bug incident in a classroom.
- 1 bed bug is not an infestation.
- Breeding infestations in a school are rare.
- An infested classroom will require professional treatment and parent notification.
- (State laws often require notification of parents if any pest infestation is detected.)

INSPECTIONS

- Thoroughly inspect the surrounding area where the bed bug was found.
- Include desks, floors, walls and storage areas.
- Inspect any closets or lockers used to store the person's belongings.
- Arrange for an inspection by a management professional.
- Map out bed bug sightings and confirmed findings.

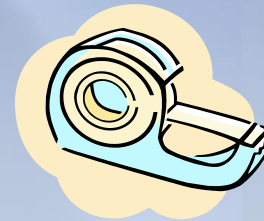
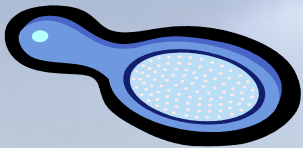


INSPECTING FOR BED BUGS

Identify the presence of multiple bed bugs.



- Magnifying glass
- Strong flashlight
- Plastic zip-bags, lint roller or scotch tape
- Mirror



Inspection (Human or Dog)

- Humans will take several hours (time is money)
- Dogs are excellent detectors: schools and school busses.
- Inspect at regular intervals.
- Dogs signal only on live bugs!!
- **Never pay for a treatment if the handler cannot show you a live bug.**
- Be present for the inspection.
- No light hits!!!!



VirginiaTech
Invent the Future®

UNUSUAL HARBORAGES



Inspecting for Bed Bugs



**Look very carefully.
Can you see hitch hikers on this backpack?**

SCHOOL BED BUG HOT SPOTS

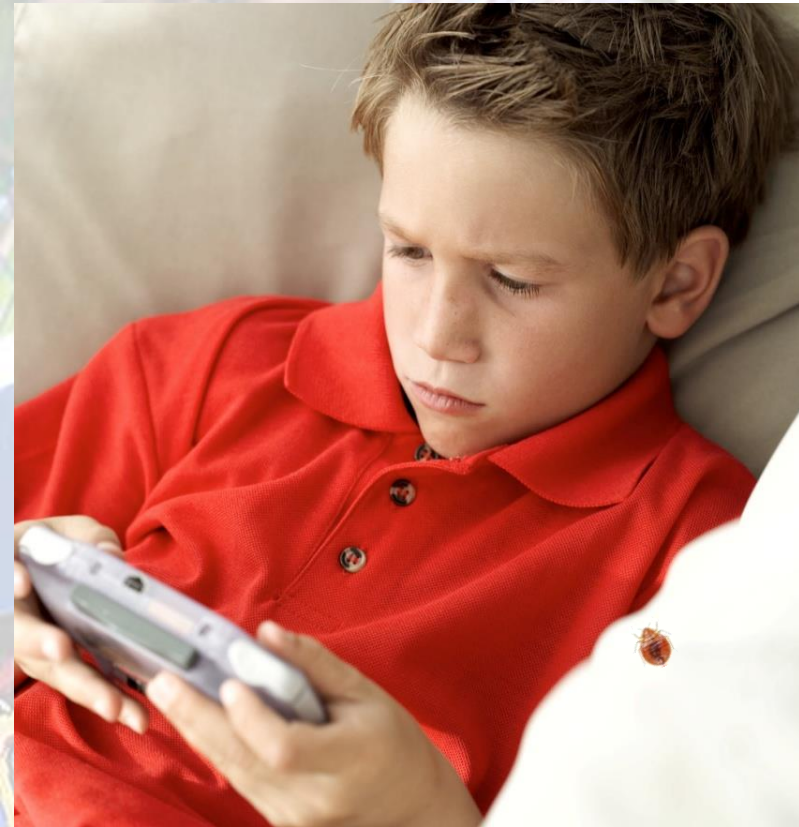
- School staff break rest areas.
- Closets and lockers for coats, hats, and backpacks.
- Faculty lounge, office area or nurses office with upholstered furniture or cots.
- Classrooms with upholstered furniture.
- Schools with childcare facilities or dormitories.



COMMON BED BUG MYTHS

You only get bedbugs if you are dirty.

- Bed bugs are not a sign of sanitary issues.
- They're after only one thing.
- They thrive where humans sit still for more than an hour.
- You get bed bugs by exposure.
- Travel.



Bed Bug Integrated Pest Management

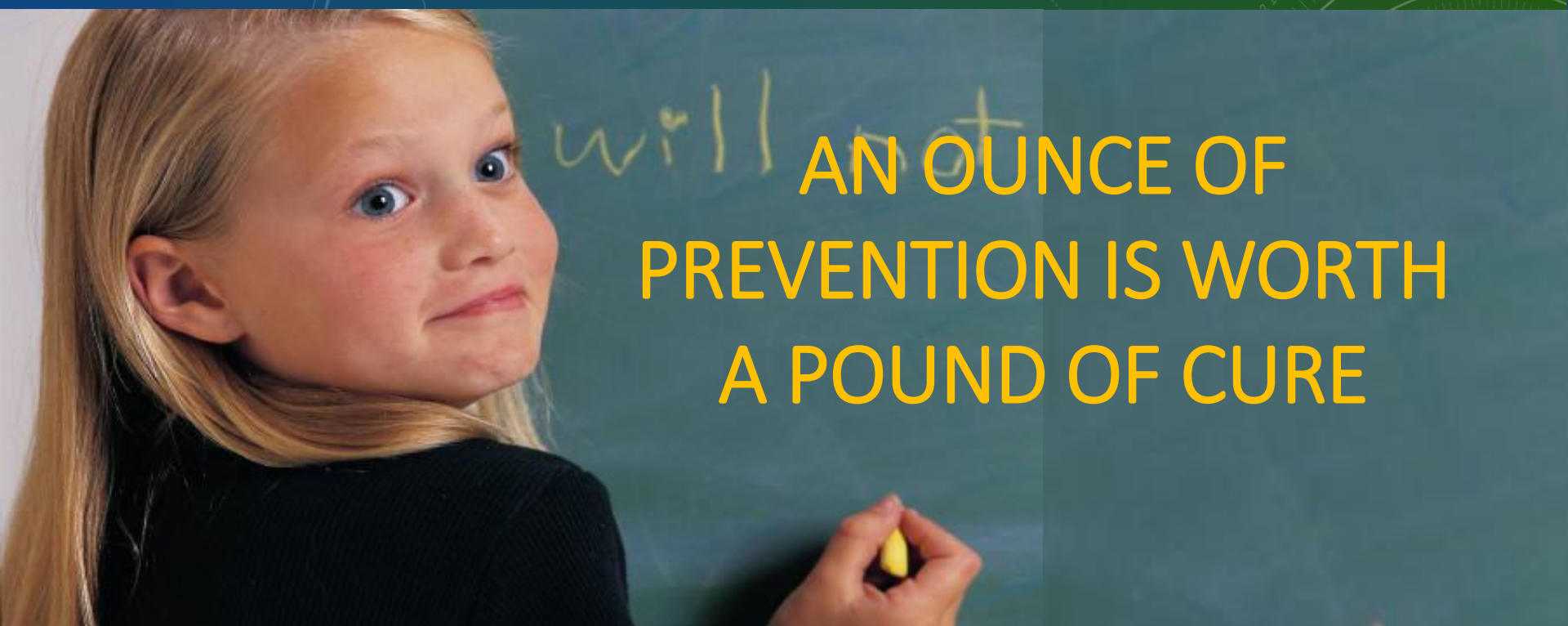
The combined use of monitoring and sanitation (prevention) and least toxic strategies (control) to reduce the need for repeated pesticide applications.

- 5 steps

1. Inspection and monitoring
2. Pest identification (is it a bed bug?)
3. Population evaluation (introduction or infestation?)
4. Least toxic most effective control strategies
 - Chemical, heat, desiccant dust?
5. Continue monitoring

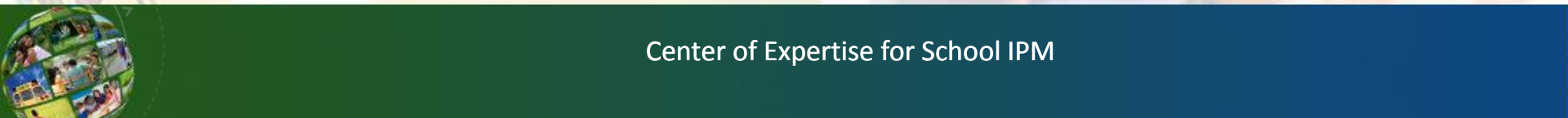
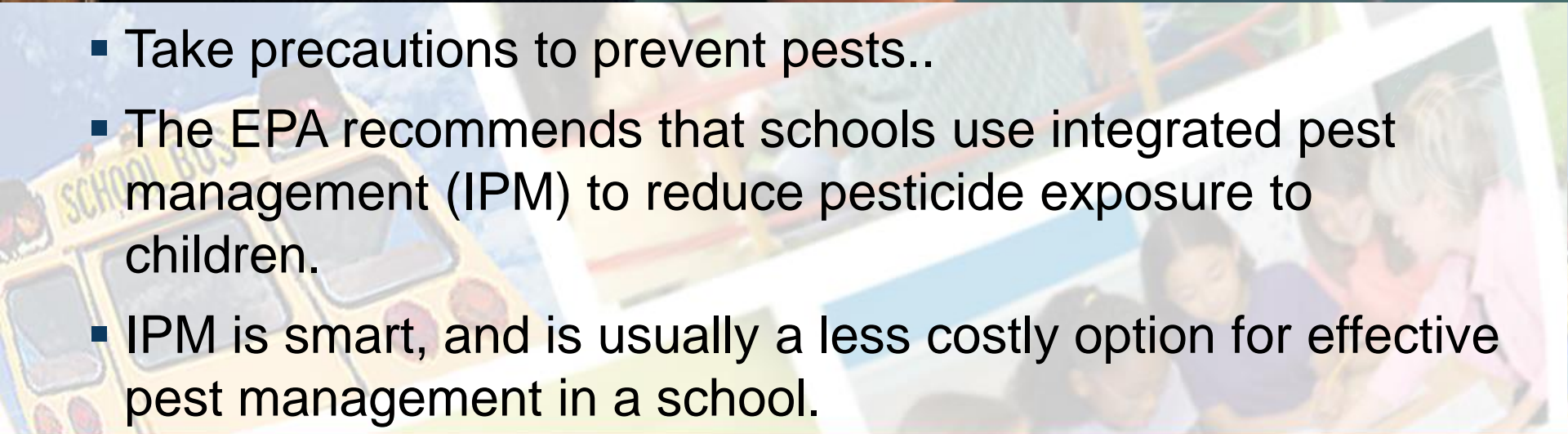
Mistaken for Bed Bugs





AN OUNCE OF PREVENTION IS WORTH A POUND OF CURE

- Take precautions to prevent pests..
- The EPA recommends that schools use integrated pest management (IPM) to reduce pesticide exposure to children.
- IPM is smart, and is usually a less costly option for effective pest management in a school.



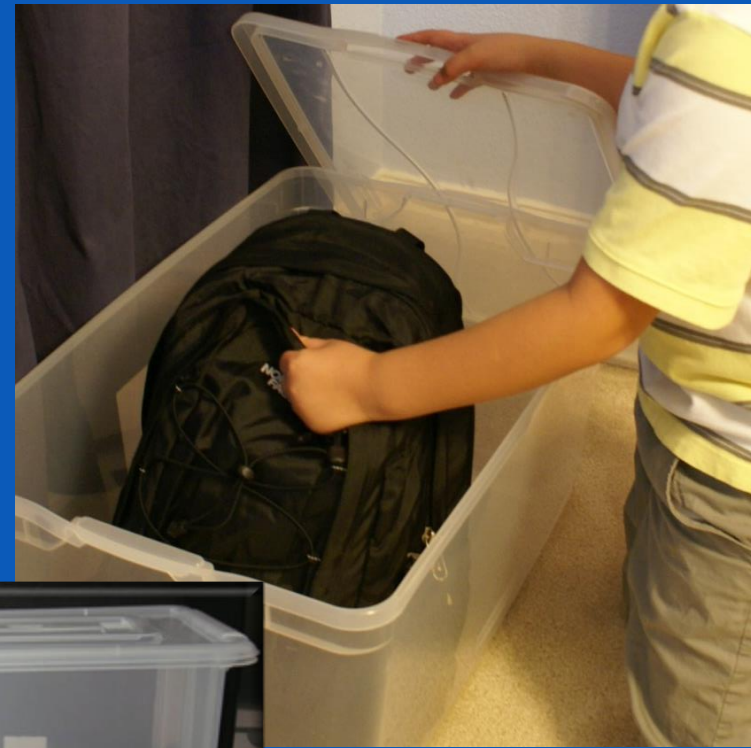
ELIMINATE CLUTTER / HARBORAGE

- The bed bug's ability to hide is one of the main reasons why it is such a formidable opponent.
- Clutter removal is an essential part of both bed bug and other pest elimination.



Preventing Future Introductions

- Plastic storage containers
 - Store coats, backpacks and purses
 - Look at empty containers at the end of the day
- Portable heat chambers
 - Books, electronics, etc.



LIMITING THE ITEMS BEING BROUGHT INTO SCHOOL...

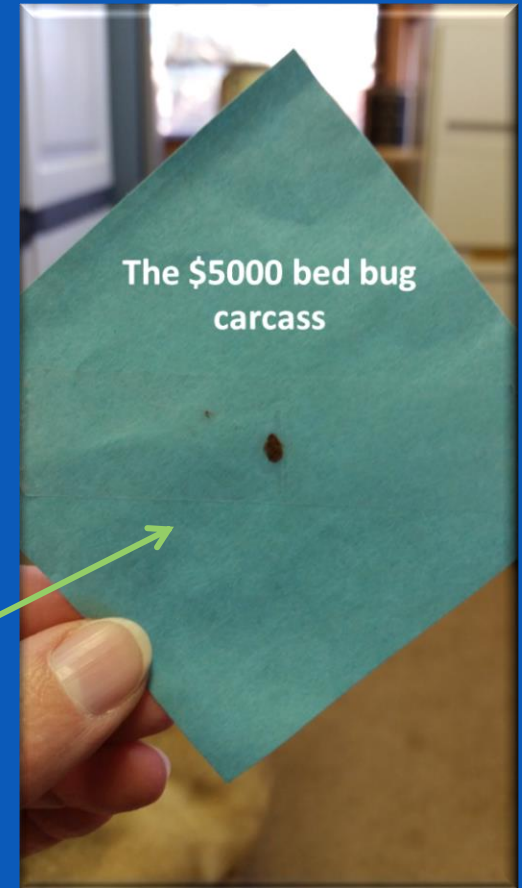
will reduce the chances of bed bugs being brought in.

- Identify items to leave at school until the end of the school year.
- Identify items, such as books, that can be left at home until the end of the year.
- Place books in zip bags.
- Ask parents to frequently heat-dry bed linens, jackets, backpacks and clothes.



Select An Experienced Pest Control Company (or Else!)

- Start interviewing companies **before** you have bed bugs.
 - References, protocols, and product names
 - Ask about follow-up inspections
- Do not expect that your current company has experience in bed bugs. **Ask!**
- If you call in hysterics (Now! Now! Now!) **you will pay a premium price.**
- **Assignment: Have two companies identified by the end of January 2015**
- Time is money!



The price of panic!

COMMON BED BUG MYTH

**Pesticide applications alone
will easily eliminate bed bugs
infestations.**

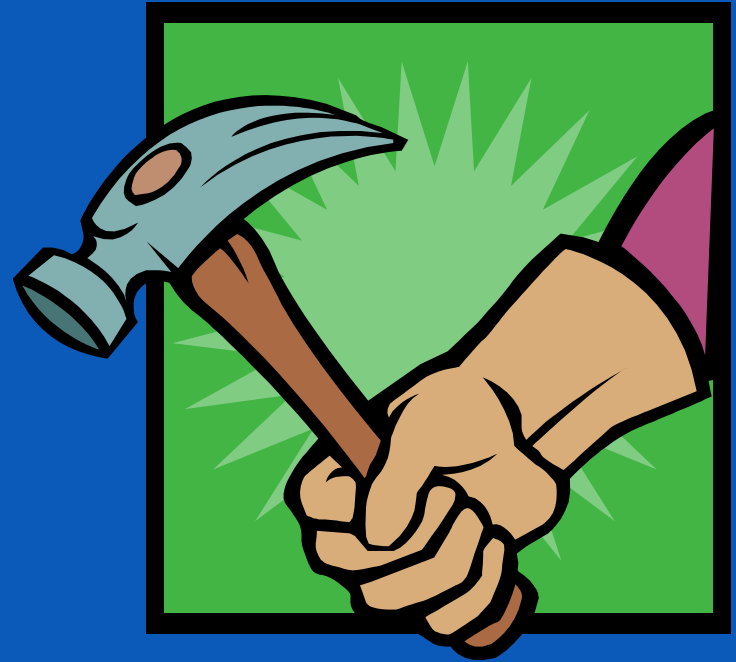


- Proper use of pesticides may be one component of a general pest strategy, but may not eliminate bed bugs alone.
- In addition, bed bug have developed resistance to many common pesticides.
- Some bed bug populations can only be controlled though a comprehensive (IPM) treatment strategy that incorporates a variety of techniques and vigilant monitoring.



Why We Don't Have “*The Answer*”

- Most liquid products will kill bed bugs if you apply them directly.
- Consumers do not realize that killing bed bugs *we can see* is not the problem.
- **Our problem is controlling resistant infestations!!!**



Why not just hit each bug with a hammer?

RESISTANCE IS NOT IMMUNITY

MULTIPLE TYPES OF RESISTANCE

- **Three types of Resistance:**
- Reduced cuticular penetration
- Enhanced Mixed Function Oxidase (MFO) Activity
- *kdr* or Knockdown resistance

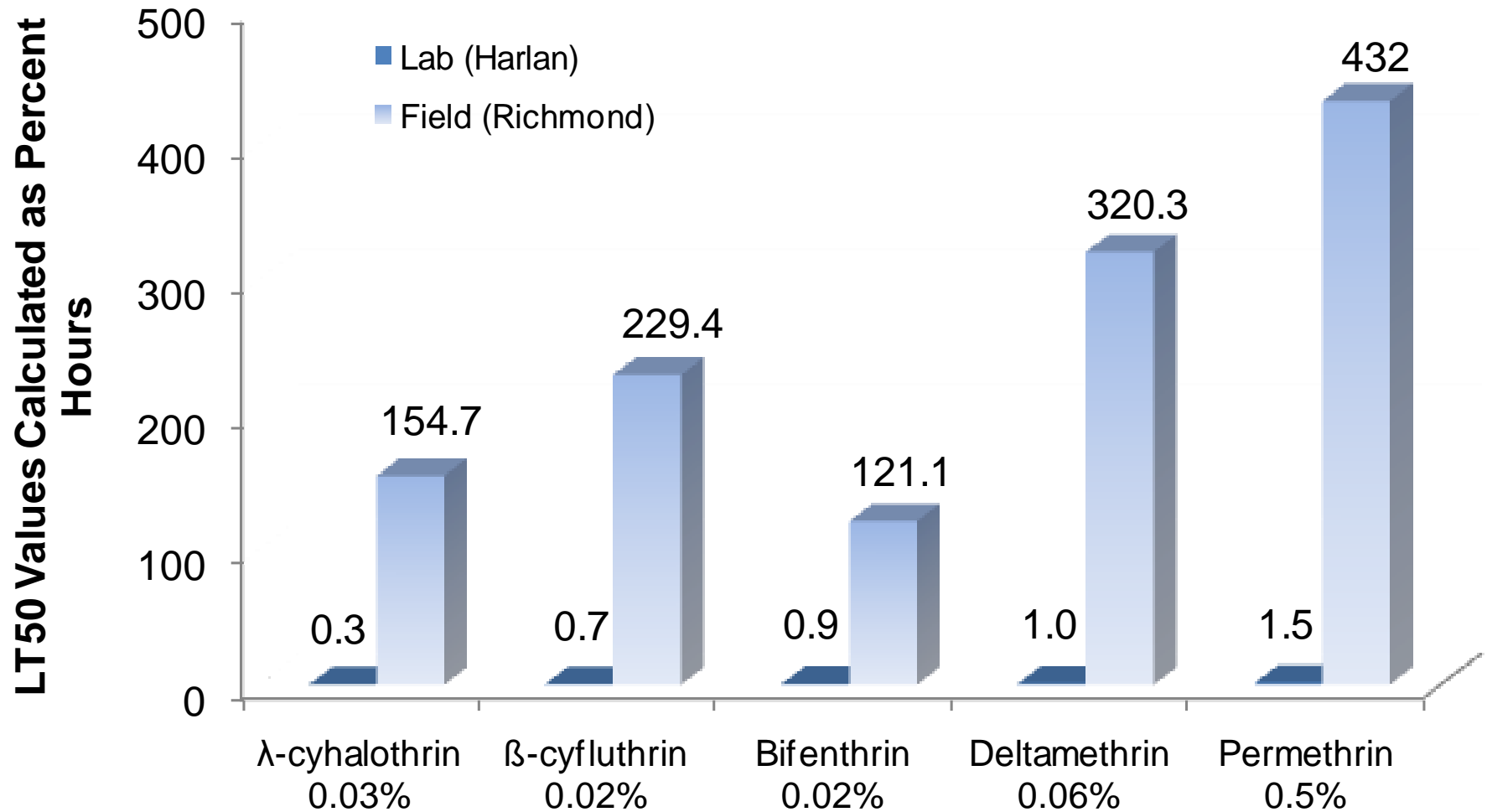
I feel a little twitchy after walking along that baseboard last night

Me too, but just sleep it off. You will feel better in a couple of hours.



FreakingNews.com

How Resistant Are These Bed Bugs?



Newest And Most Novel Formulations

- Crack and crevice applications.
- Resistance to pyrethroid products is very high.
- May require multiple applications.
- Not all populations are equally resistant or resistant to the same products.
- No residual spray product



Insecticidal Dusts

- Work better than liquids because they cover the entire body
- Much longer residual than liquids
- Cannot be applied where air currents might move dusts around
- Not the best choice for using in schools (limited label)
- **Very important that you know what products are being used in your schools**



Desiccant Dusts

- Desiccant dusts are ultimately more effective than sprays
- Resistant strain died in ~36 hours
- Diatomaceous Earth
 - insecticide grade 2-3 days
- Silica dust
 - 2-3 days
- Lasts unchanged in wall voids for years in low humidity



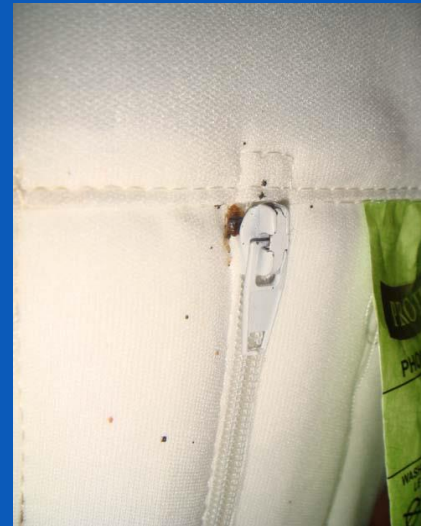
VACUUMING!

- Immature bed bugs often hide in the shed skins of their older siblings
- Vacuum the floor, furniture, and perimeter,
- Remove bed bug exuvia!!!



Mattress Encasements

- Encasements for furniture
- Must have a zipper protector sewn in
- Traps bed bugs and eggs, bite proof and escape proof
- Will not keep bed bugs from crawling on the encasements.



> \$70 retail

STEAM

- Steam temperature (at the bed bug) must be 130° F (54° C) or greater
- The steam head must be large
- Steam power will kill bed bugs and their eggs
- Steaming is slow and labor intensive



**Upholstery and bedding can
disperse steam heat
Thermal death point 48°C**

Pack Tite ® \$350



Heat Chambers



Do it Yourself \$600

Large chamber \$6000.00



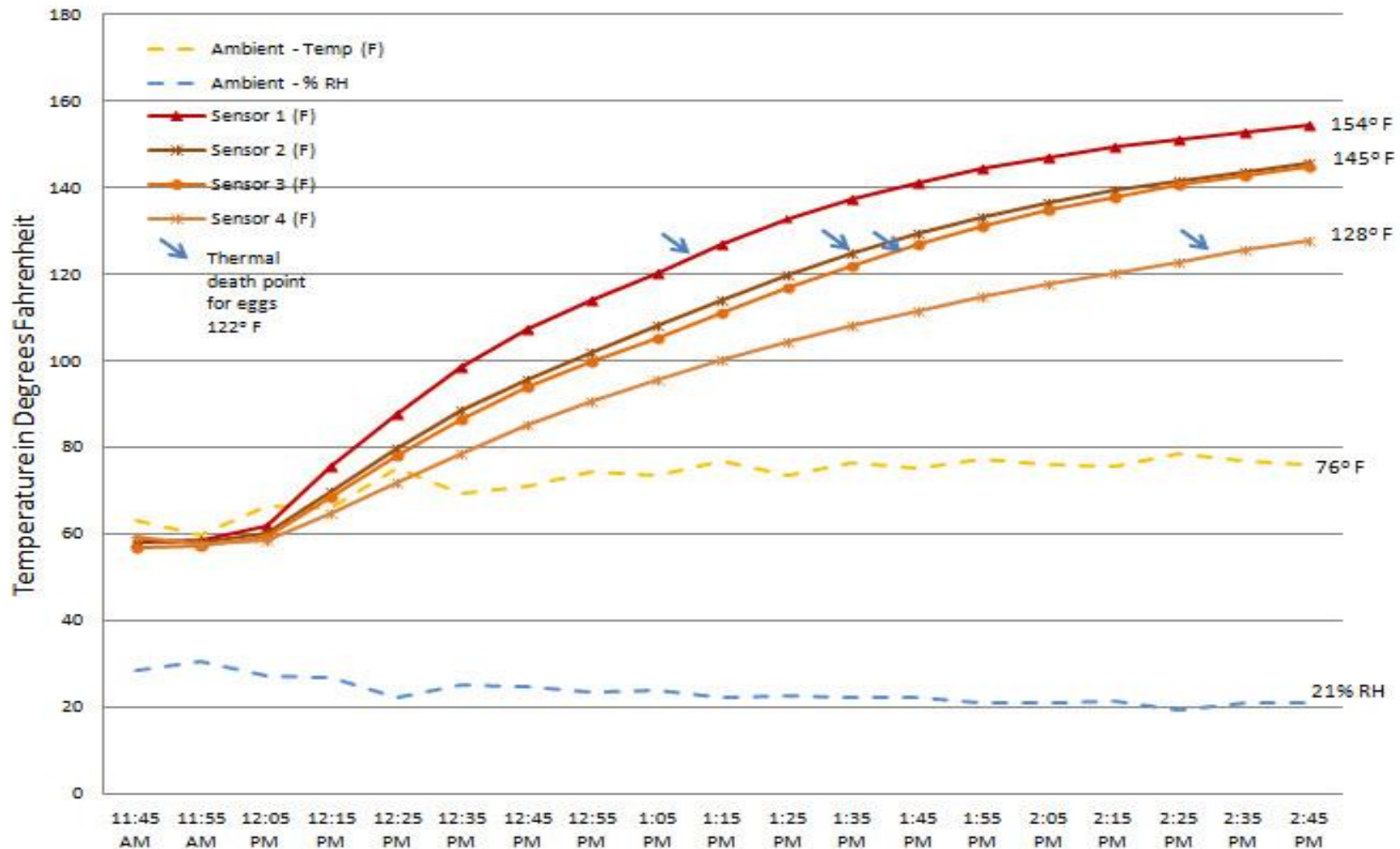
Structural Heat Systems (\$85K-\$100K)

- Propane or electric
- Fans circulate heat: 7- 24 hours.
- Sensors in hardest to heat location
- Very effective when used correctly
- Are these systems large enough to heat treat a classroom?



You Need This Record

Sensor Temperatures (°F) Over 3 h



Beware of “Heat Treaters”

The screenshot shows a web browser window displaying the BioGreen Solutions website. The browser's address bar shows the URL <http://biogreensolutions.net/index.html>. The website has a dark green header with the BioGreen Solutions logo on the left. The main content area is white with green accents. On the left side of the main content area, there is a vertical navigation menu with the following links: HOME, ABOUT US, PROACTIVE SOLUTIONS, THERMAL BEDBUG SOLUTIONS, ODOR SOLUTIONS, REMEDIATION SOLUTIONS, NEWS, F.A.Q., and CONTACT US. The main content area features two large green boxes. The first box is titled "Is Your Business Bedbug Free?" and contains a close-up image of a dog's nose. Below the image, the text reads: "How extensive is the damage to your business if bedbugs are discovered? Our proactive canine". The second box is titled "Have Bedbugs?" and contains a small image of a bedbug. Below the image, the text reads: "BioGreen Solutions is the only company in the United States to offer a complete set of services specifically designed to detect, eliminate and provide unique post-treatment solutions for bedbugs. CLICK HERE TO LEARN MORE". At the bottom of the website, there is a "News" section with the date "July 19, 2013" and the headline "BioGreen Solutions continues to". The browser's taskbar at the bottom shows various application icons and the system clock indicating 11:12 AM on 10/17/2013.

bio**green** SOLUTIONS

HOME
ABOUT US
PROACTIVE SOLUTIONS +
THERMAL BEDBUG SOLUTIONS +
ODOR SOLUTIONS
REMEDiation SOLUTIONS
NEWS
F.A.Q.
CONTACT US

taking clean to the next level™

The Leader in Proactive Contamination Management
Is your facility Certified BioGreen Clean? 888.247.8889

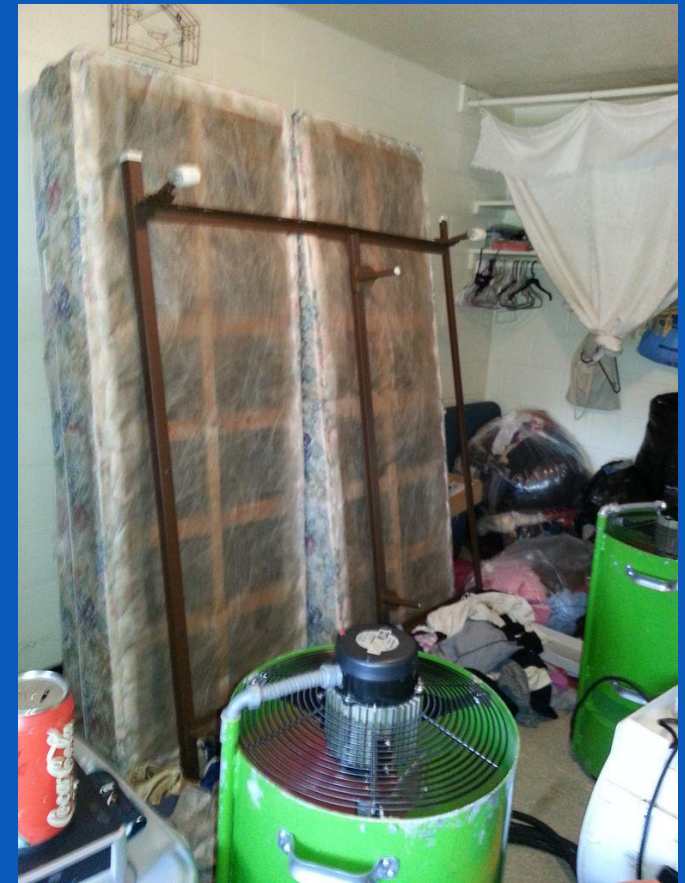
Is Your Business Bedbug Free?

How extensive is the damage to your business if bedbugs are discovered? Our proactive canine

Have Bedbugs?
BioGreen Solutions is the only company in the United States to offer a complete set of services specifically designed to detect, eliminate and provide unique post-treatment solutions for bedbugs.
CLICK HERE TO LEARN MORE

News
July 19, 2013
BioGreen Solutions continues to

These heaters do not have the fire power needed to heat an apartment of this size.



Thermal Death Point:
Nymphs and adults- 118°F
Eggs- 122°F

This “bed bug heater” will never, EVER kill the bed bugs in this room!



Residents pay for the electricity.



Passive Monitors

- Before and after treatment
- Used for detecting small infestations
- Used to determine the success of a treatment
- Used as a method of early detection
- So far no active monitor has performed significantly better than the passive monitors
- Also use post-treatment
- **Do not work if no one checks them!**



Final Thoughts

1. Always monitor after treatment (IPM).
2. Know what bed bugs look like.
3. Introduction versus infestation.
4. Have a code of practice.
5. Have an experienced pest management company.
6. Know what you are getting for your money.
7. No freaking out!
 - You must be the one in control of your facility.



Bed bugs are only increasing in the United States. You need a plan for the next 10 years!



EPA'S BED BUG STRATEGY

- EPA works within our regulatory mandate to:
 - Encourage new pesticides and new uses
 - Ensure that products registered for bed bug control will work as advertised
 - Serve as a support for communities and others in search of reliable control information
 - Educate the public and stakeholders about proper use of pesticides to minimize incidents and maximize success



EPA'S RESPONSE TO BED BUG SITUATION

- Since 2009, EPA has:
 - Expedited every new application for bed bug use
 - Collaborated to form the Federal Bed Bug Workgroup (FBBWG)
 - Held two national summits
 - Highlighted public health implications of bed bugs with CDC
 - Created extensive bed bug web page, made major improvements
 - Issued \$550K in grants to states for bed bug activities
 - Developed numerous webinars, symposiums, etc.
 - Generated a product search tool
 - Worked to improve efficacy evaluations (ongoing)
 - Worked with the FBBWG to develop a national strategy
 - Formed a information clearinghouse for communities
 - Worked with FTC to highlight inappropriate pesticide marketing

Collaborative Strategy on Bed Bugs



Prepared by
The Federal Bed Bug Workgroup¹
March 2014

¹ The Collaborative Strategy on Bed Bugs reflects a broad-based consensus of federal agencies. It is an outcome of the interagency Federal Bed Bug Workgroup. The Strategy was authored by key agencies (CDC, EPA, HUD, USDA) and includes technical information and input from the Department of Defense and the National Institutes of Health. The cover photo was downloaded from the CDC Public Health Image Library (<http://phil.cdc.gov/phil/home.asp>).



COLLABORATIVE STRATEGY ON BED BUGS

- Draft strategy defines four priority areas (first three pertain to schools):
 - Prevention
 - Surveillance and IPM
 - Education and Communication
 - Research



COLLABORATIVE STRATEGY: CRITICAL ELEMENTS FOR SUCCESS

- Science-based
 - Planning project with objective and accepted science
 - Basing actions on assumptions may cause waste or duplicated effort and resources
- Evaluated for measurable success
 - The most sustainable programs evaluate the success of individual intervention efforts
 - Helps identify best candidates for sharing with other communities



REVISED BED BUG WEB PAGE

- EPA's new and revised bed bug web page went live on April 21st
 - Contains both new and existing information
 - Put all EPA content (Reg'l and HQ) in same place
 - www.epa.gov/bedbugs one of most frequently visited pages on epa.gov
 - We welcome any comments or suggestions that you might have on the revamped site

Pesticides Home

Controlling Pests Home

Basic Information

Residents

Housing Managers

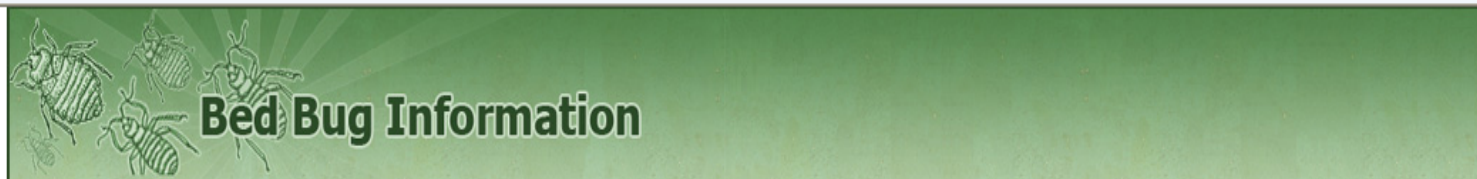
Lawn & Garden

In Agriculture

At School

Questions about Chemicals?

Resources for Pest Management



The common bed bug (*Cimex lectularius*) has long been a pest – feeding on blood, causing itchy bites and generally irritating their human hosts. The Environmental Protection Agency (EPA), the Centers for Disease Control and Prevention (CDC), and the United States Department of Agriculture (USDA) all consider bed bugs a public health pest. However, unlike most public health pests, bed bugs are not known to transmit or spread disease.

They can, however, cause other [public health problems](#), so it's important to pay close attention to preventing and controlling bed bugs.

Experts believe the recent increase in bed bugs in the United States may be due to more travel, lack of knowledge about preventing infestations, increased resistance of bed bugs to pesticides, and ineffective pest control practices.

The good news is that there are ways to control bed bugs. Getting good, solid information is the first step in both prevention and control. While there is no chemical quick fix, there are effective strategies to control bed bugs involving both non-chemical and chemical methods.

On this page;

- [Identifying Bed Bug Infestations](#)
- [Treating Bed Bug Infestations](#)
 - [Non-chemical Treatments](#)
 - [Chemical Treatments](#)
 - [Bed Bug Product Search tool](#)
- [Preventing Bed Bug Infestations](#)
- [Bed Bug Pesticide Alert - Important!](#)
- [Hiring Pest Management Professionals](#)
- [Bed Bug Biology](#)
- [Common Bed Bug Myths](#)
- [Questions and Answers](#)
- [For More Information](#)

Resources

- [Draft of the Federal Strategy on Bed Bugs Available for Public Comment](#)
- [New items in Bed Bug Information Clearinghouse](#)
- [Bed Bug Product Search tool](#)
- [Bed Bug Information Clearinghouse](#)
- [Top Ten Bed Bugs Tips \(Disponible en español\)](#)
- [Joint Statement on Bed Bug Control](#)
- [Development of Methods for Efficacy Testing of Bed Bug Pesticide Products](#)

[Learn the Issues](#)

[Science & Technology](#)

[Laws & Regulations](#)

[About EPA](#)

Bed Bugs: Get Them Out and Keep Them Out

[Contact Us](#) [Share](#)

Where are the bed bugs?

Find them, get rid of them: An introduction to bed bugs



- [December 16, 2014 - EPA to Host Webinar on Bed Bugs in Schools](#)

- [Bed bug tip of the month](#)

Don't panic!

There is no need to throw out all of your things. With some effort, most items can be saved.

[Read more about bed bug control options.](#)

- [More Tips](#)

Learn About Bed Bugs



- [Introduction to bed bugs](#)
- [Characteristics of bed bugs](#)
- [How to find bed bugs](#)
- [Bed bug information clearinghouse](#)
- [What landlords need to know](#)

Prevent Infestations



- [Protecting your home](#)
- [Protecting yourself at school or office](#)
- [Tips for travel](#)
- [Print an information card to carry with you](#)

Get Rid of Bed Bugs



- [Using integrated pest management](#)
- [Pesticides for bed bug control](#)
- [Steps for "do-it-yourself"](#)
- [Safety issues in controlling bed bugs](#)
- [Find help with bed bug problems](#)

Questions?

- [Qs and As about bed bugs](#)
- [Ask a question](#)
- [Bed bug myths](#)
- [Regional bed bug contacts](#)

Popular Topics and Resources

- [Top ten tips to prevent or control bed bugs](#)
- [Public health issues](#)



Get email alerts

[sign up](#)



SHARING INFORMATION TO IMPROVE EFFECTIVENESS

- Schools can be focal points for communities, setting knowledge and tone
- Sharing successful strategies for communications and training can
 - Reduce costs
 - Improve quality and success of initiative
- Although pest controllers are on front lines, quality of training for employees and education for clients may vary



EPA'S COMMUNICATIONS CLEARINGHOUSE

- Clearinghouse on EPA's bed bug website to facilitate sharing materials
 - Provides accurate, unbiased information
 - Offers consistent, but not duplicative, information
 - Promotes more efficient communications on a local level
- Special area of the site to house communication materials specific to schools
 - Additional contributions would help this area be more useful (must be *.edu or *.gov links)



Bed Bugs

[Contact Us](#)[Share](#)[Bed Bugs Home](#)[Learn about Bed Bugs](#)[— Characteristics of Bed Bugs](#)[— Finding Bed Bugs](#)[Protecting Your Home](#)[Protecting Yourself in Public Places](#)[Getting Rid of Bed Bugs](#)[— Do-it-yourself Bed Bug Control](#)[— Pesticides to Control Bed Bugs](#)[Bed Bug Information Clearinghouse](#)[Bed Bug Product Search Tool](#)[Finding Help with Bed Bug Problems](#)

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Bed Bug Clearinghouse by Audience

Search the library by:

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On this page:

- [All Audiences](#)
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- [Hotels](#)
- [Housing Authorities](#)
- [Landlord](#)
- [Pest Management Professional](#)
- [Retail Facilities](#)
- [Residential Consumer](#)
- [Schools/Childcare](#)
- [Shelters](#)
- [Travel/Transportation Services](#) (airlines, trains, buses)
- [Workers Entering Homes](#)

All Audiences

Look at the "[Publications of general interest](#)" to find items that would contain material of potential interest to all audiences, such as bed bug biology, etc.

You will need Adobe Reader to view some of the files on this page. See [EPA's About PDF page](#) to learn more.



Web Page: www.epa.gov/bedbugs

For clearinghouse issues and ideas:

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Other items:

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BENEFITS OF SCHOOL IPM

- **Smart:** healthier learning environment for children
- **Sensible:** addresses the root cause of pest problems
- **Sustainable:** better long-term control of pests
- **Savings:** Long term implementation may reduce energy costs and may reduce pest management costs



Questions on Bed Bugs in Schools?



school.ipm@epa.gov