BED BUGS: THE UNWANTED CAMPER

GUIDE TO BED BUG-FREE CAMPING

HOW TO:

FIND THEM · IDENTIFY THEM · IMMEDIATELY ELIMINATE THEM IN A NON-TOXIC WAY

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GUIDE TO BED BUG-FREE CAMPING

How to:
Find Them • Identify Them
Eliminate Them in a Non-Toxic Way
(Even Pesticide-Resistant Bed Bugs)

FINDING BED BUGS BEFORE YOUR CAMPERS DO

Bed Bugs on the Rise

Bed bugs were virtually nonexistent in the US until the late 1990s. However, in the last seven to eight years, they have made a comeback. Many experts believe it is due to a number of factors:

1. DDT, which initially wiped them out, has been banned for years.
2. There is more international travel with bed bugs hitch-hiking on luggage.
3. Bed bugs have developed a resistance to modern insecticides.

Bed Bugs "Hitch-Hike" on Luggage

Since campers bring luggage, whether used for international or domestic travel, staff should be alert to the possibility of bed bugs being unknowingly brought into their camp.

Between each session, staff should thoroughly check for signs of bed bugs.

VIDEO:
WHAT TO LOOK FOR,
HOW TO IDENTIFY
https://youtu.be/EVk3xFCIDQA

Take Preventive Action Between Sessions

Bed bugs don't just hide in mattress seams. They hide in just about any dark corner or crevice. Take a flashlight and look for signs of bed bugs, including the apple-seed sized insects, exoskeletons, small black specs (bed bug waste deposits), and blood specs. Some common areas to search:

- Under the bunk bed frames
- Behind the bed frames
- Under furniture, tabletops and legs
- Along baseboards
- In drawers

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IDENTIFYING BED BUG BITES


photo courtesy: bedbugs.org

Small, Red, Itchy Bumps Grouped Together Can Indicate Bed Bugs

If a camper complains of itchy bites, it could be flea, mosquito or bed bug bites.

It can be difficult to tell the difference, however bed bug bites typically pop-up overnight and are numerous, small and grouped closely together.

Some people can develop larger swollen areas or welts.

If a camper suffers bed bug bites, know that the insects do not carry disease. The redness and itch typically eases within a week or so. In the meantime, treat the bites with:

- A hydrocortisone skin cream
- An oral antihistamine, such as Benadryl

Watch for any skin infection from scratching the bites, and if necessary, consult a doctor for an antibiotic.

ELIMINATING PESTICIDE-RESISTANT BED BUGS

Rise of Pesticide-Resistant Bed Bugs

Bed Bugs Have Become Resistant to Traditional Pesticides

Ohio State University entomologists have found **bed bugs are becoming resistant to the specific pesticides formulated to eliminate them.**

They theorize bed bugs have boosted their natural defenses by **generating higher levels of enzymes that can cleanse themselves of common pyrethroid-based pesticides.**

Numerous studies have come to the same conclusion.

With these developments in mind, it is important to understand the difference between neurotransmitter chemicals and mechanical killing agents when it comes to combatting bed bugs.

How Traditional Pesticides Work

The most common pesticides for eliminating bed bugs contain pyrethrin and pyrethroids. These formulations **cause death by attacking the bug's nervous system via entry through the shell.**

Once inside the bed bug's body, the insecticide disrupts the nerve-impulse transmission, stimulates nerve cells and causes tremors, spasms, paralysis, and eventually death.

Evolved Defenses Prevents Pesticide Effectiveness

Studies have discovered bed bugs have evolved **three improved biochemical defenses against these common pesticide ingredients.** They have developed:

1. Higher levels of detoxification enzymes.
2. Nerve cells better able to withstand the chemical effects.
3. A thicker shell that blocks common insecticide ingredients better.

The most active of these defense mechanisms are found in the bug's shell, improving the bug's ability to block or slow the insecticide from reaching the nerve cells.

If the insecticide penetrates the shell, the additional defensive measures prevent the toxins from attacking the bug's nervous system.

To combat this evolving bed bug resistance to insecticides, manufacturers will add additional ingredients (synergists) to circumvent the detoxification mechanism of the bed bugs.

Adding Even More Chemicals Won't Solve Resistance Problem

Basically, more chemicals are added to the formulation to increase the toxicity of the insecticide.

These new, boosted formulations may work for a while. However, according to Fang Zhu, Ph.D., Washington State University, evidence shows when bed bugs are exposed to lethal doses of pyrethroids, they **begin to develop resistance within a few generations -- which can be less than one year.**

Problems with Neurotransmitters

No Residual Kill

In addition the bed bugs' ability to generate defensive mechanisms against chemicals, there are other issues to consider.

Pyrethrins degrade rapidly, **meaning there is no residual kill effectiveness.**

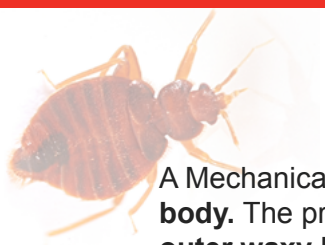
Chemical Impact on Humans and Pets

More significant is the research pointing to the effects on humans and pets. A study conducted by the University of California, Davis, discovered disturbing effects of pyrethroids on pregnant women. **Children of mothers residing in a one mile radius of agricultural pyrethroid insecticide applications just before conception or during third trimester were at greater risk for both Autism Spectrum Disorders (ASD) and Developmental Delay (DD).**

How Mechanical Killing Agents Work

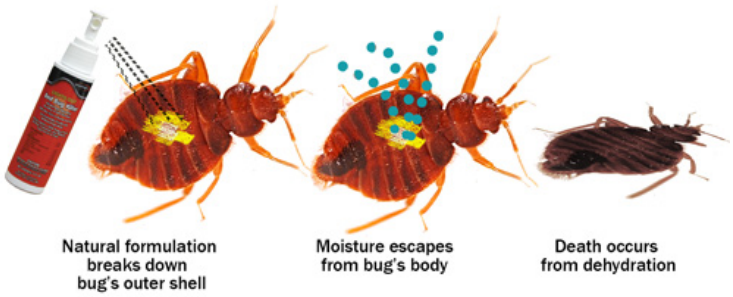
Mechanical Killing Agents work differently, **bypassing the need to be absorbed into the insect's body to attack the nervous system.**

Therefore, **they are not subject to the same immune response that bed bugs are developing for neurological agents.**



Non-Toxic Formula Kills by Breaking Down Shell to Cause Death by Dehydration

A Mechanical Killing Agent **causes the onset of mortality without having to enter the bug's body.** The precisely manufactured formulation works immediately to **break down the bed bug's outer waxy layer, thus causing a fatal rupture of the exoskeleton and death by dehydration.**



LIGHTS OUT Bed Bug Killer is an example of a Mechanical Killing Agent and is the non-toxic alternative to pyrethroid-based pesticides. It is made with ingredients which qualify for the 25 (b) exemption in the EPA Pesticide Regulations or considered G.R.A.S (Generally Regarded As Safe).

Third Party Efficacy Certification

When considering a non-toxic, Mechanical Killing Agent to address bed bug infestations, be sure to **look for third-party certification assuring effectiveness.**

The American Academy of Entomological Science (AAES) has tested LIGHTS OUT Bed Bug Killer and has certified it begins the onset of bed bug mortality within minutes and is effective in eliminating bed bug infestations.

VIDEO:
WATCH EFFECTIVENESS OF MECHANICAL KILLING AGENT
https://youtu.be/5NVIV1W8yi4

Residual Kill Requirements

Females Lay Between 900 - 2800 Eggs in 6 Months

Female bed bugs lay about five eggs each day throughout their adult lives, which can be between 6 and 12 months. Eggs hatch in about 4 – 12 days and go through five nymphal stages, each one requiring a blood meal before molting to the next stage.

This is significant, as experts point out **a single, fertilized female bed bug can infest an entire apartment building.**

They can move quickly, too. In lab experiments, **bed bugs have been shown to wander more than eight feet in just five minutes.**

This is why **there must be a mechanism for continued, residual killing**. Many exterminators will contract for return visits to address this requirement.

Residual Kill for 30 days

The composition of a Mechanical Killing Agent, such as LIGHTS OUT, addresses the need for residual kill ... for up to 30 days!

The AAES certification of LIGHTS OUT also confirms the formulation's ability to adhere to treated surfaces for thirty days and continue to kill bed bugs emerging from their hiding places, as well as bed bug nymphs.

Because the mechanical kill process breaks down the hard shell, it is also effective on other hard shell pests such as cockroaches, fleas, ants, millipedes, and carpet beetles.

For more information about LIGHTS OUT Bed Bug Killer, an EPA 25(b) Exempt Bio-Pesticide, visit www.QuestSpecialty.com

References:

"Massive Resistance: Bed Bugs' Genetic Armor Shields Them from Pesticides," Scientific American.com, Marissa Fessenden, March 14, 2013, http://www.scientificamerican.com/article/massive-resistance-bed-bugs/

"How Bedbugs Shrug Off Pesticides and Simple Measures to Deal with It," American Chemistry Society, Press Release, September 9, 2013. http://www.acs.org/content/acs/en/pressroom/newsreleases/2013/september/how-bedbugs-shrug-off-pesticides-and-simple-measures-to-deal-with-it.html

"Genetics Explain How Bedbugs Infect a Building – or a Country," Scientific American, Katherine Harmon, December 7, 2011, http://www.scientificamerican.com/article/genetic-bedbug-inbreeding/

"Pesticides to Control Bed Bugs," U.S. Environmental Protection Agency Fact Sheet, http://www.epa.gov/bedbugs/pesticides-control-bed-bugs

"Insecticides," U.S. Environmental Protection Agency Fact Sheet, http://www3.epa.gov/caddis/ssr_ins_int.html

"Pyrethrum, How It Works," McLaughlin Gormley King Company, http://www.pyrethrum.com/how_it_works.aspx

"Neurodevelopmental Disorders and Prenatal Residential Proximity to Agricultural Pesticides-The Charge Study," Environmental Health Perspectives, 6/3/14, Janie F. Shelton, Estella M. Geraghty, Daniel J. Tancredi, Lora D. Delwiche, Rebecca J. Schmidt, Beate Ritz, Robin L. Hansen, and Irva Hertz-Picciotto, http://ehp.niehs.nih.gov/1307044/

"Parasites: Bed Bugs – Biology," Centers for Disease Control and Prevention Fact Sheet, http://www.cdc.gov/parasites/bedbugs/biology.html

"How To Find Bed Bugs - How to Know If You Have Bed Bugs," howdini.com, https://youtu.be/EVk3xF-CIDQA

"Bed Bugs Disappear for 40 Years, Now They're Back with a Vengeance. Here's What to Know," Sean Rossman, USA TODAY, June 21, 2017.

LIGHTS OUT Bed Bug Killer Fact Sheet, QuestSpecialty Corporation, Brenham, TX, http://questspecialty.com/products/4650-Lights-Out-Bed-Bug-Killer.html