smartsolutions

bed bugs

BASF Pest Control Solutions
The Evolution of Better Pest Control

BASF
The Chemical Company

The Problem with Bed Bugs

Few pests pose control challenges as complex as bed bugs. Hard to find, persistent, and increasingly pervasive, bed bugs require considerable professional expertise, and significant client cooperation.

As if that weren't enough, research has shown that bed bug strains showing resistance to pyrethroid insecticides are now widespread throughout the United States. Factor in the repellency-related problems associated with pyrethroids and it's clear a smarter approach to controlling bed bugs is sorely needed.

The SmartSolution for Bed Bugs

The SmartSolution for Bed Bugs from BASF Pest Control Solutions is based on the latest research, the Prescription Treatment® IPM approach, and new, effective strategies utilizing breakthrough materials with significant advantages over residual pyrethroids.

This guide is dedicated to discussing the strategy and treatment aspects of controlling bed bugs using a foundation of non-pyrethroid products.

A Non-pyrethroid, Nonrepellent Foundation

Traditionally, pyrethroids have been used to provide quick knockdown of bed bug populations, and, in the past, they have been effective in this capacity. But repellency and widespread pyrethroid resistance in bed bugs have made pyrethroid treatments unreliable as a stand-alone solution.

In fact, control failures often blamed on application problems might actually be due to the increased occurrence of resistant bed bug strains. This resistance is genetically conferred to subsequent populations *(Table 1)*, which then show resistance to other chemical tools within the same class of chemistry. In other words, the problem involves all pyrethroids and is likely only to get worse.

Table 1:
Pyrethroid Resistance is Widespread

Field Samples With >10x Pyrethroid Resistance Came From States Indicated in Orange

The nonrepellent products in the SmartSolution for Bed Bugs from BASF, on the other hand, have shown *no indication of resistance* in bed bugs. What's more, as the name implies, they do not repel bed bugs like pyrethroids can. This is important because bed bugs that survive pyrethroid treatments during the knockdown process can abandon nesting sites and relocate to avoid pyrethroid-treated areas.

University of Kentucky research showed that when given a choice between pyrethroid-treated harborages or pyrethroid-free harborages, bed bugs prefer the latter.

Even if bed bugs overcome the repellency effect when seeking blood meals, simply crossing a pyrethroid barrier is not enough to kill them. Significant mortality requires extended exposure to a dry pesticide residue which is best achieved through a treatment of the harborage areas. The long-lasting residues from the foundational nonrepellents in the SmartSolution for Bed Bugs will kill bed bugs for an extended period of time.

The Foundation Products

Phantom® termiticide-insecticide, Prescription Treatment® brand **Phantom**® Pressurized Insecticide, and Prescription Treatment® brand **Alpine**® Dust Insecticide effectively kill pyrethroid-resistant and non-resistant bed bugs, and, as nonrepellents, will not disperse or "lock in" pests. In addition, they utilize different classes of chemistry to avoid the development of resistance.

Phantom delivers long-lasting, nonrepellent control of pyrethroid-resistant and pyrethroid-susceptible bed bugs, and quick kill of newly hatched nymphs. Its long residual activity allows it to control subsequent bed bug populations, making it highly effective as a part of any long-lasting control protocol, and as a preventative treatment. When **Phantom** and Prescription Treatment® brand **ULD® HydroPy-300®** Pyrethrin Concentrate are tank mixed, research has shown 96.7% knockdown of bed bugs within 20 minutes after treatment.

Phantom Pressurized Insecticide, with its dry formulation, kills pyrethroid-resistant and non-resistant bed bugs significantly faster than many other nonrepellent formulations. And independent research shows that **Phantom** kills bed bugs at all life stages.*

Prescription Treatment brand **Alpine** Dust Insecticide features the nonrepellent active ingredient dinotefuran, which has been granted Reduced Risk status for public health use by the EPA, making it ideal for bed bug prone voids, even in sensitive accounts.

*Dini Miller, Department of Entomology, Virginia Tech University 2009; Insects Investigations Ltd, Cardiff, UK 2009; Jerome Goddard, Department of Entomology and Plant Biology, Mississippi State, 2011; Snell Scientifics, Barnesville, GA, 2011

Controlling Active Bed Bug Infestations

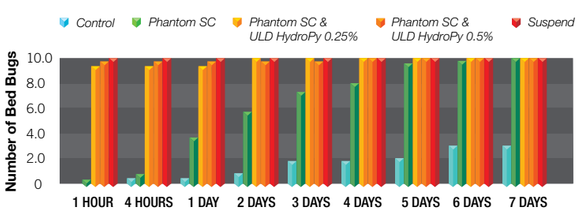
Eliminate Exposed Bed Bugs

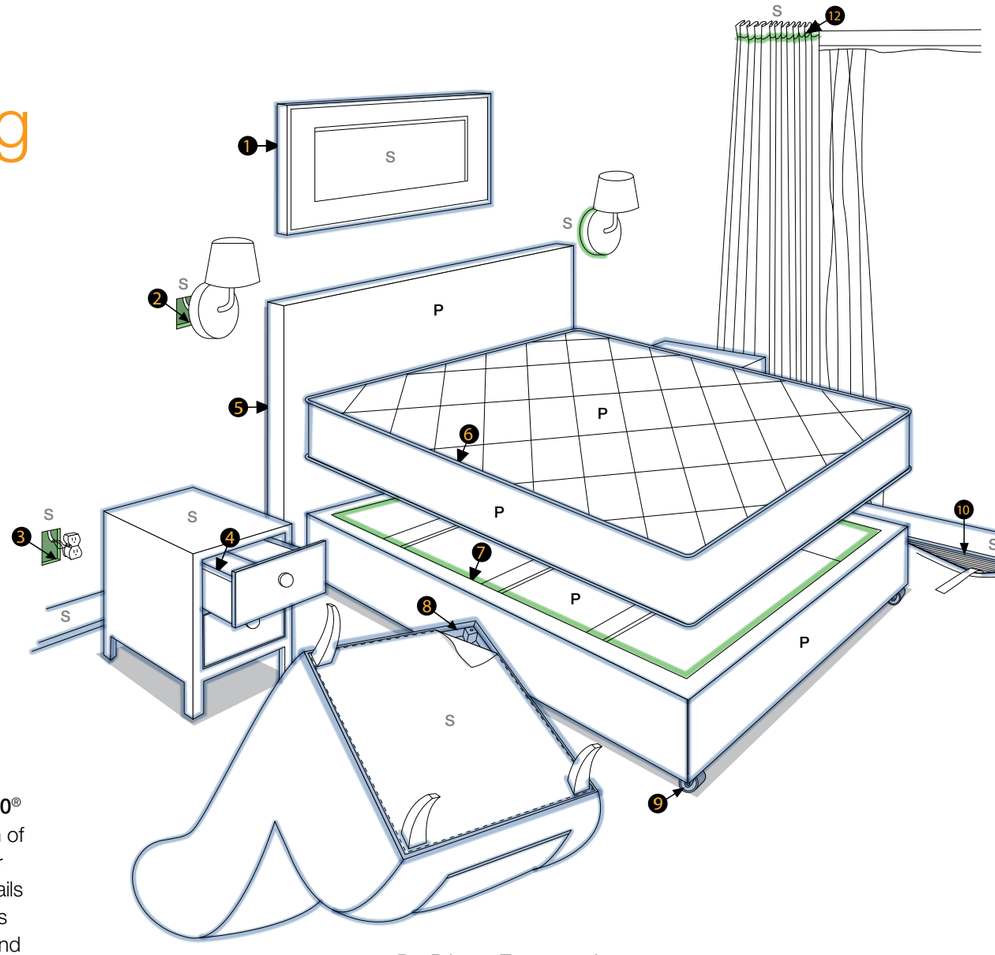
Vacuuming and other mechanical means of quickly killing and removing exposed bed bugs are recommended as a first step toward controlling an infestation. Focus on accessible harborages and areas disturbed during preparation where bed bugs may have scattered. Nymphs are very small and eggs nearly invisible, so complete reliance on these methods to physically remove all bed bugs is not realistic.

A directed contact treatment for quick reduction of bed bug populations is necessary in most situations where bed bugs are found, especially in complex harborages where the mechanical methods are less effective. A tank mix of **Phantom**® termiticide-insecticide and Prescription Treatment® brand **ULD® HydroPy-300®** Pyrethrin Concentrate provides quick knockdown of bed bugs. Treating and neutralizing eggs wherever bed bugs are found is also very important. This entails application of an insecticide to exposed bed bugs within a localized area. To ensure that resistance and repellency will not sabotage your control efforts, the smartest approach is to start with a nonrepellent foundation using **Phantom** termiticide-insecticide and/or Prescription Treatment® brand **Phantom**® Pressurized Insecticide.

Figure 1:

Bed Bug Mortality After Topical Treatment-Lab-Reared





P Primary Treatment Area
S Secondary Treatment Area

To learn more BASF Proactive Bed Bug Treatment Protocol, visit: pestcontrol.basf.us/campaigns/bed-bug-proactive-program.

Treat Likely Harborages

Crack & Crevice® treatments are common around bed frames, box springs, headboards, and in cracks and crevices associated with baseboards, mouldings, carpet edging, wall fixtures, night stands, dressers, and other hard furniture. Spot treatments are common on baseboards, undersides of dressers, drawers, and to certain areas of other furniture that bed bugs are likely to crawl on near aggregation sites or en route to feeding. **Phantom** and **Phantom** Pressurized Insecticide are recommended for spot and Crack & Crevice treatments due to their respective residual action and effectiveness in killing eggs.

Void treatments are applications to enclosed spaces where insects may live, hide, or travel. Common voids are hollow bed frames, platforms, walls, and other hollow structures. Dusts provide excellent long-term control when applied to voids and other harborage areas. Prescription Treatment® brand **Alpine**® Dust Insecticide is a nonrepellent dust labeled for bed bugs, and its Reduced Risk* active ingredient, dinotefuran, makes it ideal for sensitive accounts.

*Dinotefuran, the nonrepellent active ingredient in Alpine insecticides, has been granted Reduced Risk status for public health use by the EPA.

1. Pictures and other wall hangings should be removed from wall for thorough Crack & Crevice treatment.
2. Wall fixtures, such as mounted lamps, should be detached to treat voids located behind them.
3. Electrical faceplates should be removed to treat wall voids behind them.
4. Drawers should be removed for easy access to all cracks and crevices on the interior of the cabinet, as well as the tracks and support of the drawers. Don't forget the underside of the cabinet.
5. Headboards should be removed from the wall or dismantled to allow thorough treatment to cracks, crevices, and voids located on or behind them.
6. Mattresses should be dealt with carefully. Be clear on label directions as they pertain to mattresses prior to treatment.
7. Box springs and bed platforms should be lifted and turned over for thorough investigation, and for access treatment to all sides, including the underside and internal areas.
8. Upholstered furniture should be inspected and treated in a way very similar to bed and box spring. Pay careful attention to all seams and folds, as well as the legs and dust liner on the underside.
9. Wheels, casters, posts, and legs of all furniture should be closely examined and treated.
10. Pulling carpet back from the wall often reveals a void beneath baseboard mouldings.
11. Baseboards should be spot treated, especially when they are in dark, undisturbed areas, such as behind the bed or other furniture. Baseboards often have an unsealed seam along the top where they meet the wall, and along the bottom where they meet the floor. If not sealed, be sure to treat these gaps.
12. Curtains can be removed from the window and heat-treated in a dryer, steam cleaned or spot treated. Be careful to test treat the fabric to avoid staining.

PHANTOM® PRESSURIZED INSECTICIDE can be used interchangeably PHANTOM® TERMITICIDE • INSECTICIDE

Alpine® DUST INSECTICIDE

Table 2:

Treating Sensitive Areas

Product	Actives	Formulation	Signal Word	USE PATTERNS: Crack & Crevice	USE PATTERNS: Spot	USE PATTERNS: Void	Mattress Statements	System III compatible
Phantom termiticide-insecticide	chlorfenapyr	liquid. *nonrepellent residual*	caution	■	■		**DO NOT** make surface applications to mattresses. Mattress treatments must be confined to the seams, folds, and edges only. Remove linens and wash before reuse. Allow to dry before remaking bed.	
Phantom Pressurized Insecticide	chlorfenapyr	pressurized *nonrepellent residual*	caution	■	■		**DO NOT** make surface applications to mattresses. Mattress treatments must be confined to the seams, folds, and edges only. Remove linens and wash before reuse. Allow to dry before remaking bed.	■
565 Plus XLO contact insecticide	pyrethrin + PBO +MGK 264	contact insecticide	caution	■	■	■	Treat mattresses and box springs especially tufts, folds, and edges.	■
P.I. contact insecticide	pyrethrin + PBO	contact insecticide	caution	■	■	■	Treat mattresses and box springs especially tufts, folds, and edges. Also treat other areas where bed bugs may be harboring.	■
Alpine Dust Insecticide	dinotefuran + D.E.	dust	caution	■		■	**DO NOT** use this product on mattresses, pillows, bed linens, or clothes.	

Address Sensitive Areas

Bed bugs, as the name implies, are often closely associated with the bed and human hosts. While direct treatment of troubled areas like this is tempting, it's important to keep in mind that people spend an average of one-third of their day on or around their beds. Always consult and follow the label and refrain from any deviance from the label language. The table above *(Table 2)* lists the variations in the label language relative to the treatment of one of the most sensitive areas: the mattress. Following treatment, mattress covers are often recommended to prevent future infestation in this sensitive area and to reduce risk associated with human contact of treated surfaces.

The BASF Proactive Bed Bug Treatment Protocol

The cost to the hospitality industry of having rooms with bed bug infestations is enormous. By utilizing the BASF Proactive Bed Bug Treatment Protocol, steps can now be taken to prepare a room for the event of bed bug infestations in a way that significantly reduces the likelihood that a bed bug infestation will take hold and spread.

When weighing cost and time commitment involved in the treatment of bed bugs, BASF believes it is important to consider the value proactive treatments can present to customers in the hospitality industry, and other accounts like public transportation, movie theatres, and health care, to name a few.

Achieving proactive success requires insecticides with sufficient residual activity to give reliable results. Multiple classes of chemistry are also important to avoid the problems associated with resistance.

Initial hotel case-study data shows that protocol—utilizing nonrepellent Prescription Treatment® brand **Phantom®** Pressurized Insecticide, **Phantom®** termiticide-insecticide, and Prescription Treatment® brand **Alpine®** Dust Insecticide—can successfully stop the spread of bed bugs.

Phantom Pressurized Insecticide, **Phantom** termiticide-insecticide, and **Alpine** Dust Insecticide are nonrepellent and effective on both pyrethroid susceptible and resistant strains, including pyrethroid-resistant bed bugs. They also utilize three different chemical modes of action to help avoid the development of resistance.

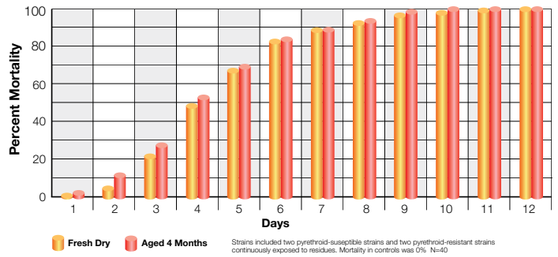
By treating primary bed bug colonization areas twice a year and secondary initiation areas annually *(see diagram on page 4)*, BASF believes existing or future bed bugs will be killed and additional reproduction and reinfestation can be controlled.

For complete information on the BASF Proactive Bed Bug Treatment Protocol, visit: **pestcontrol.basf.us/campaigns/bed-bug-proactive-program**.

Figure 2:

Average Cumulative Percent Mortality for Four Strains of Bed Bugs Exposed to Fresh Dry Residues of Phantom 0.5% and Residues Aged Four Months.

Alvaro Romero, Kenneth F. Haynes, University of Kentucky.

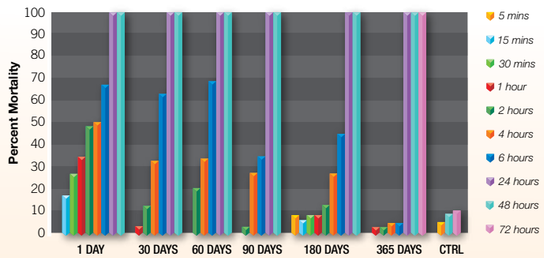


Strains included two pyrethroid-susceptible strains and two pyrethroid-resistant strains continuously exposed to residues. Mortality in controls was 0% N=40

Figure 3:

Alpine Dust Insecticide Research

Bed Bugs (Cimex lectularius)



Insect Investigations, Ltd. 2007

Research from the University of Kentucky shows dry deposits of Phantom termiticide-insecticide aged 4 months kill bed bugs just as quickly as fresh dry deposits *(Figure 2)*. In another study, Alpine Dust Insecticide was shown to kill bed bugs one year after application *(Figure 3)*.

Smart Support

As always, BASF Pest Control Solutions is committed to giving you everything you need to tackle your toughest pest control challenges—not just in terms of products, but in terms of expertise and support as well.

You can always find helpful information, training, marketing support, and more at PestControl.basf.us. Log on and download brochures, customer cooperation aids, and treatment scenarios to help you better understand and prepare for this challenging pest.

Get Smarter

This SmartSolution for Bed Bugs is just one of many planned BASF SmartSolutions to address the pest control challenges and issues that have the greatest impact on our industry and the success of your business. To inquire about additional SmartSolutions for **ants, German cockroaches, flies, fleas, occasional invaders, rodents or termites,** contact your BASF Pest Control Solutions sales representative.

The Prescription Treatment® Approach

BASF Pest Control Solutions believes a sound Integrated Pest Management strategy is the cornerstone of successful pest control and good stewardship. Our five-step Prescription Treatment approach includes the core IPM practices you should always employ in conjunction with any BASF SmartSolution.

1 **Inspect** to gather the information that leads to good decisions.

2 **Prescribe** a treatment strategy to achieve specific goals in the account.

3 **Communicate** with the client to promote cooperation, establish expectations, and convey value.

4 **Treat** using effective techniques and materials that support the strategy.

5 **Follow up** to assess results.

Always read and follow label directions.
www.PestControl.basf.us

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