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A primer for using desiccant dust to control and prevent bed bugs.

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Desiccant dust has been around in one form or another for decades. For some pest management professionals, it's a go-to product for controlling and preventing bed bugs. Others can benefit greatly from its use.

WHY? Desiccant dust kills bed bugs by damaging the waxy layer of the cuticle that helps them retain moisture, thus causing them to dry out.

So far the pests haven't figured out a way to resist dehydration even though some have developed ways to resist conventional insecticides. "Resistance to desiccating dust is exceedingly rare in the insect world," said Mike Potter, urban entomologist, University Kentucky.

Neither do the dusts lose efficacy like some liquid insecticides once they have dried on treated surfaces.

"These desiccant dusts are one of the few products that are available right now that work after the technician has left the building," said Dini Miller, urban entomologist, Virginia Tech, of dusts' long-lasting residual activity.

Lab tests by University of Kentucky researchers found that silica gel dust applied to carpet substrates remained potent for 18 months and that even a short exposure to the dust was lethal for bed bugs, achieving 100 percent mortality within two days. When the researchers applied the dust to bed-bug-infested apartments that had neither been prepped nor treated by other means, they achieved a 98 percent reduction of the pests.

Pros-in-the-know shared how to make the most of these products:

Less is definitely more. An application of desiccant dust must be so light that the bed bugs are willing to walk through it, which is what causes them to pick up a lethal dose. "If you apply it too heavily, I think a lot of insects are smart enough to avoid it," said Miller.

"If you see the dust you have too much applied. You should barely be able to tell it's even there," added Elia Levin, owner of 5 Star Pest Solutions, Indianapolis.

Focus on points of interception. Apply desiccant dust where bed bugs most likely will come in contact with it. Depending on the level of infestation, this may involve dusting the legs of bed frames and furniture, the seams, tufts and framework of upholstered furniture, the seams of mattresses and the underside of the box spring before encasing them.

"Your bed bug has to come in contact with the product. Obviously, it has to be put where they behaviorally are going to be either living in a brood center or meandering about" in search of a blood meal, said Levin.

Three Types of Desiccant Dust

Diatomaceous earth (DE), a natural non-toxic product mined from the fossilized remains of microscopic plants (diatoms), is abrasive and acts like super-fine sandpaper on the insect's cuticle when it crawls over or through it.

Silica gel, a non-toxic synthetic version of DE, works more like a sponge, sucking the wax off the outer shell of the insect. The name is confusing — it's a dust, not a "gel" — and like DE it is amorphous (non-crystalline), which greatly reduces the potential hazard to humans should they inhale it.

Eliminate inter-unit travel. In multi-unit housing where bed bugs can move between units, use a power duster to apply the dust above shared drop ceilings (often found in bathrooms) and in the voids behind medicine cabinets and utility openings.

Also apply dust around the unit's perimeter where the carpet and baseboard meet. "Desiccant dusts are excellent barriers to put around there," said Miller.

Different levels of infestation and clutter require different strategies for controlling the pests, advised Miller.

And while airborne silica gel or DE is not considered a health hazard, Potter urged PMPs to take extra care to limit this around people with respiratory ailments. He also said silica gel was far more effective as a dust than as a suspension mixed with water, as allowed for on the label.

Which Dust is Best?

Recent studies on diatomaceous earth and **silica gel** by the University of Kentucky indicate the latter may be PMPs' best choice of desiccant dust.

“Diatomaceous earth is not nearly as good a desiccant as silica gel,” said Mike Potter, who led the studies. “(Silica gel) tends to be lighter, more amorphous in shape, it clings to the bug better, it absorbs the wax layer better and somewhat faster.”

“That’s probably one of the best products we have out there right now,” agreed Dini Miller, urban entomologist, Virginia Tech. Desiccant dusts with insecticide may deliver a double-whammy to bed bugs, but where and how they can be applied is more limited per the label.

Play Defense!

A desiccant dust “can be used either as a primary or a supporting secondary material. It depends on the level of infestation and how quickly you need to accomplish the elimination,” said **Levin**.

Satisfy the desire for green. “Desiccating an insect totally makes sense. How green do you have to be to use something that simply dries it out,” asked **Levin**.

As such, Bryan Nichols, owner, Advanced Maintenance and Pest Solutions, Chicago, uses silica gel as a stand-alone green treatment for some jobs. “It’s been very successful in getting rid of the bed bugs and also keeping my clients more at ease. It has the safety profile that allows us to really breeze through a lot of the chemo-phobic questions that come about” and also reduces the risk should a resident return home to find that a treatment was done but who wasn’t told of this beforehand by the landlord, said Nichols.

“It’s a great tool to have in your toolbox,” said **Levin**.

The author is a frequent contributor to PCT.

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