

Just the Facts About ...

Controlling Pests Naturally: Diatomaceous Earth & Desiccants

There are substances, called desiccants, which literally dry out any item or animal that contact them directly. The body of an insect, like that of other animals, is filled with liquid substances, like blood and digestive secretions. A waxy protective coating on the outside of their bodies prevents moisture loss. Desiccants kill cockroaches, silverfish, slugs, ants, fleas, beetles, etc., by destroying this waxy layer. The two most effective desiccants for general insect control are diatomaceous earth and silica aerogel.

Diatoms

Approximately 300 million years ago, countless trillions of minute one-celled plants called diatoms existed in the oceans. They constructed tiny shells about themselves out of the silica they extracted from waters. When the diatom died, its microscopic shell was deposited on the floor of those ancient seas. Through the centuries, these shells eventually collected into deposits, sometimes thousands of feet thick. When the waters receded, the deposits were eventually covered and the shells fossilized and compressed into a soft chalk-like rock called diatomaceous earth.

When diatomaceous earth is quarried, milled, finely ground, passed through a screen and put through a centrifuge, it becomes a fine talc-like powder. This powder can be safely handled with bare hands, fed to animals and used to kill insects on

contact. The process of destroying insects with diatomite is entirely mechanical, unlike the action of chemical insecticides.

Diatomaceous earth is a non-toxic, inert material containing useful minerals such as manganese, magnesium, iron, titanium, calcium, silicon, and so on. Proper milling cracks apart the diatom skeleton, exposing microscopic silica needles.

Sharp and hazardous to the insect, these needles are harmless to humans and other warmblooded animals. The tiny size and razor-like construction of a diatomite fragment is just right to disrupt the life process of insects. The size of warmblooded animals - as well as physical differences - confines the destructive effects of diatomaceous earth to insects.

The reason is that the skeleton of warmblooded animals is inside, surrounded and wrapped by the muscle which it supports, and the entire organism is protected by hair, fur, or feathers. Insects, however, have their frame outside. Vital fluids are held in and protected by an oily or waxy seal over a hard porous cover. If an object is small and sharp enough, it will scratch the insect's waxy seal, allowing insect to dehydrate and die. Minute sharp particles are also taken internally by certain insects and interfere with their breathing, digestion and reproduction. The tough external tissues of animals make them immune to damage from these same microscopic needles. (J. Mullin, *Acres U.S.A.*, August 1978 issue. See also *National Geographic*, June 1979)

Silica Aerogel

Silica aerogel is a non-abrasive, chemically inert substance that is used as a dehydrating agent because the small particles absorb moisture and oils. Sometimes small bags of silica aerogel are inserted in electrical equipment packages to prevent the accumulation of moisture during shipping or storage. Silica aerogel is also used in the florist trade and often can be purchased from a florist.

Using Desiccants

When using desiccants please note: they don't work when wet. Because of this, only use them in dry areas. Place the material in a duster or a flexible bottle that has a small, narrow nozzle (less than 1/4") and apply a thin coating of the material. Many small puffs of dust are better than one large application.

Even in dry locations, the material will eventually absorb moisture from the air. When placed in a closed, dry space, it will remain active under normal conditions for about two - three weeks.

During the humid summer months, the desiccants will probably not be effective longer than one week. Use small amounts and re-apply often. This dust can harm motors and electrical equipment, so avoid using it near any appliances.

Visit the DEP website for more information on non-toxic pest control methods and products.

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