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Pesticides

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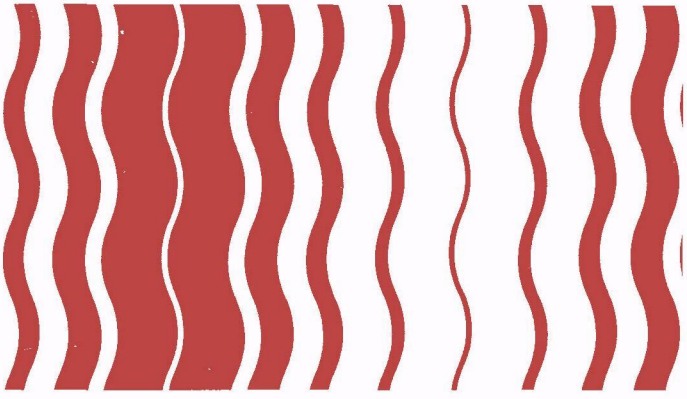
Termiticides

Consumer Information



Extensive use of chemicals to control termites began in the late 1940s, following the registration of chlordane as a pesticide in 1948. Over the next several years, three additional, chemically related compounds—heptachlor, aldrin, and dieldrin—were registered as termite control pesticides ("termiticides"). All four chemicals were also registered and used to control other insects in agriculture and around the home.

By 1983, the U.S. Environmental Protection Agency (EPA) had cancelled nearly all uses of chlordane, heptachlor, aldrin, and dieldrin except for termite control applications. These cancellation actions were based on evidence that these chemicals cause cancer in certain laboratory animals and break down slowly in the environment. The continued use of these four compounds for termite control was allowed because there were no effective alternative chemicals available at the time of EPA's decisions. Now, however, effective alternatives for subterranean termite control are available.

EPA had previously concluded that when chlordane, heptachlor, aldrin, and dieldrin were applied correctly for subterranean termite control, the residents of treated homes would not be exposed to the pesticide. However, new studies received in 1987 show that generally most pesticides used for subterranean termite control can be found at low levels in the air of properly treated houses. In some circumstances, air levels of chlordane, heptachlor, aldrin, or dieldrin may pose a health risk to occupants.

More details on chlordane, heptachlor, aldrin, dieldrin, and termiticides in general can be found in the questions and answers below.

Q What are chlordane, heptachlor, aldrin, and dieldrin, and how are they related?

A These four chemicals are pesticides used to kill subterranean termites. They are organic chemicals called chlorinated cyclodienes (pronounced cyclo-*dye*-eenz).

Of the cyclodiene termiticides, chlordane is the most widely used. Other trade names for chlordane are Gold Crest Termide®, Gold Crest C-100®, Gold Crest C.I.O.-20®, Chlor-kill®, Octachlor®, Synklor®, and Topiclore®. Commercial chlordane products actually contain both chlordane and heptachlor.

(In this leaflet, we refer to the group—chlordane, heptachlor, aldrin, and dieldrin—as "cyclodienes," rather than repeating the separate chemical names.)

Q Why are termiticides used?

A Termiticides protect your home from termite damage. Termites eat wood—in buildings, fence posts, other wood products, tree roots, and fallen timber. They can be very destructive. Termites invade buildings through wood that is close to or touching the soil, such as wooden porches and fences. They can also enter through small cracks or openings in concrete floors and foundations.

Q How are termiticides used?

A Effective chemical control of subterranean termites requires setting up a chemical barrier between the building's wood and termites in the soil. In addition to applying termiticide to the soil before a house is built, correct treatment may include:

- Pouring termiticide into a trench dug around the outside of the house and then backfilling the trench.

- Injecting termiticide into the soil around the outside of the house (rodding) or in the inside perimeter of a crawl space.

- Injecting termiticide into the soil beneath the house through holes drilled into the building's foundation or slab.

- Injecting termiticide into holes drilled in hollow-block walls, allowing the chemical to seep downward through the hollow areas in the blocks.

Treatment for subterranean termites requires a large quantity of chemical, special equipment and application techniques, a knowledge of termite behavior, and an understanding of the way a

house is built. Thus, termiticide treatments are more complicated than treatments for other pests around the home.

Q Are measures other than extensive chemical treatment available for termite control?

A Several alternative methods are currently available to help control termites, and other alternatives are now under development. Following are some preventive and remedial alternatives to chemical termiticide treatment.

Good housekeeping practices: Termite infestations may be prevented or minimized by such housekeeping practices as keeping wood structures (siding, piers, etc.) away from direct contact with the soil; keeping crawl spaces and immediate areas surrounding houses free of wood debris or firewood; and repairing leaky drains, faucets, gutters, or other faulty fixtures which may cause water to collect beneath or around a foundation. Following new construction, it is always advisable to remove wood scraps from around the house before backfill is spread.

Wood treated with borates: Borate-treated wood may be used to replace damaged wood, or in new construction. This alternative shows some promise for the future.

Nematodes: A product containing a certain nematode worm species that infects termites is commercially available for termite control in locations throughout the United States. However, test data from the U.S. Department of Agriculture's Forest Products Experiment Station in Gulfport, Mississippi, have raised questions about the efficacy of this particular alternative.

Barriers: Commercially available structural barriers made of steel, copper, or certain plastics can help block termite access to houses.

Non-wood building materials: Some new houses are being constructed without wood components and thus provide no food source for termites.

Bait block: The use of bait blocks—an alternative that is under development, but not yet commercially available—would involve the placement of "traps" (constructed of cellulose and a termite toxicant) around the perimeter of a house. Termites, attracted to the cellulose, would inadvertently consume the toxicant. Possible toxicants for this purpose include biological control agents such as antibiotics or growth regulators.

Molybdenum: Researchers are in the early stages of evaluating the efficacy of molybdenum compounds for termite control. These compounds kill certain bacteria that play a key role in providing essential nutrients to termites.

Q How do termiticides get inside houses?

A Vapors of cyclodienes and other termiticides can enter houses after proper or improper application.

Proper application: Factors that may contribute to vapors entering the home include cracks in concrete floors and walls, floor drains, sumps, joints, cracks in hollow block walls, and air ducts (heating, cooling, and ventilation ducts).

Improper application: Indoor contamination can arise from careless injection of liquid termiticides directly into the living space of a house, or into air ducts located in or below the slab. Surface spraying the soil or the wood in a crawl space is illegal in most states. *In fact, any indoor surface spraying of the cyclodiene termiticides is an improper application.*

Plenum construction: In this type of construction, air is circulated without ductwork through the open area below the house. This allows chlordane vapors to be drawn out of the soil and into the air of the house. Many chlordane labels prohibit application to plenum structures.

Q Once cyclodiene vapors get inside a house, what happens?

A Chlordane and other cyclodiene vapors tend to persist inside a house. EPA recently received new indoor air monitoring studies conducted in homes *properly* treated with termiticides. Approximately 90 percent of the homes treated with cyclodienes had detectable residue levels in the air one year after treatment. (Dieldrin was not included in these studies.) These studies also showed that houses built on slabs (on the surface of the ground) had lower airborne residue levels than houses with a basement or a crawl-space. Basement rooms had the highest levels. Chlordane has also been found in the soil of treated areas 30 years or more after treatment.

Q Does the existence of cyclodiene vapors inside my house affect my health?

A Although human exposure to the cyclodienes in the home may increase the risk of developing certain health problems, most people who are exposed are not likely to develop these health conditions. In fact, the risk to a particular person

of developing adverse symptoms is low. The health risks depend on the length of time you are exposed and the concentration of chemical involved.

- In humans, exposure to high levels commonly associated with misuse of the cyclodienes has produced symptoms like headaches, dizziness, muscle twitching, weakness, tingling sensations, and nausea. However, these symptoms may also indicate a wide variety of illnesses unrelated to cyclodiene exposure. If you have these symptoms, you should see your physician.

- EPA also has concerns about long-term damage to the liver and central nervous system, which may not produce symptoms you can recognize. In addition, test results have shown that exposure to the cyclodienes over a lifetime produces tumors in laboratory animals. As a result, EPA views the cyclodienes as probable human carcinogens. These effects may result from exposure at lower levels than those likely to result from misuse. EPA recognizes the uncertainty associated with inferring human health concerns from animal studies. However, many scientists believe that animal tests are the most reliable scientific evidence now available for estimating human effects.

EPA also recognizes that each individual's chances of developing symptoms are low. However, because of the large numbers of people exposed to the cyclodienes, the risk is a real one for a small percentage of the population.

Q How do I know if my house has been treated with any of the cyclodienes?

A If your house was treated for subterranean termites prior to 1981, it is likely that chlordane or one of the other cyclodienes was used. Also, prior to 1983, these chemicals may have been used in the interior to control other household insect pests, such as ants. Although new termiticides have been developed since 1981, chlordane is still the most commonly used.

EPA does not inspect homes to determine if cyclodiene termiticides have been used. Instead, we recommend that you contact the pest control company that treated your home, the previous owner of your home, or its builder.

Q What can I do to improve my indoor air quality?

A There are several ways to minimize your exposure to the cyclodienes and other air pollutants:

- Increase the circulation of clean air in your house. When weather permits, periodically open windows and doors, and use fans to mix the air. In crawl spaces, clear or add vents and install a fan to constantly vent crawl space air to the outside.

- Seal those areas that directly contact treated soil, using grout, caulk, or sealant. Fill cracks in basement and ground floors and walls, joints between floors and walls, and openings around pipes, drains, and sumps. Periodically check these areas for signs of new cracks or broken seals since houses settle over time.

- Install a system that supplies outside air to appliances like clothes dryers and furnaces that now draw air from inside the house. Appliances that use indoor air may actually help draw chemical vapors from the soil into the house through walls, floors, and basements.

- Check the condition of ducts in your crawl space or basement. Use duct tape to seal openings and joints.

Q Should I have the air in my house tested?

A If you do not suspect misapplication, testing may be of little value. If your home has been treated in the last several years, low levels of the cyclodienes could likely be found. However, these low air-concentration levels generally would not warrant corrective actions beyond those suggested for improving indoor air quality. Additional preventive measures are expensive, and their success rate in lowering air concentrations is not well established for all home construction types and situations.

If you are still concerned, answering the following questions may help you to decide whether to have your air tested:

- Do family members consistently show symptoms that could be caused by exposure to pesticides? (Check with your physician first.)

- Are there any obvious, major structural flaws, like large cracks, in the foundation or basement near treated soil? Does your basement consistently leak?

- Do some residents spend almost all of their time in the basement? For example, do you have occupied bedrooms in the basement?

Houses with air ducts located in or below the slab, or in the crawl space, and plenum houses, are particularly vulnerable to misapplication.

However, if you have one of these types of houses, this does not necessarily mean that you have a misapplication problem.

If you suspect that cyclodienes have been applied improperly in your home, you should follow the suggestions for improving air quality and have your air tested. Indications of misapplication may include the following:

- The presence of chemical odors inside your house.
- An increase in such odors when the heating or cooling system is operating.
- Evidence of a chemical spill, such as puddles or stains, in your house.

Q How can I have my house tested?

A If you decide to have your house tested, make sure that the results of such testing are reliable by having a qualified laboratory collect and analyze air samples. We recommend that you choose a laboratory proficient in both indoor air sampling and pesticide analysis.

This type of service is generally available only from commercial laboratories. Costs vary according to the amount of testing you desire to have done, but could range from about $50. to $500. To locate a laboratory in your area, call the National Pesticide Telecommunications Network (NPTN) at 1-800-858-7378, or look in the Yellow Pages under "Laboratories."

When you locate a possible laboratory, ask to see the company's references and statements of experience regarding cyclodiene sampling and analysis.

We recommend that the laboratory use the general methods described in the *EPA Manual of Analytical Methods for the Analysis of Pesticides in Human and Environmental Samples*, June 1980 (EPA 600/8-80-038). Laboratories can obtain this manual from: National Technical Information Services, 5285 Port Royal Road, Springfield, Virginia 22161.

Q What do my test results mean?

A In 1982, the National Academy of Sciences (NAS) published interim guidelines for airborne levels of certain termiticides. For example, the level for chlordane is 5 micrograms per cubic meter. These NAS guidelines should not be viewed as critical cut-off points. Additional corrective action beyond the measures to improve indoor air quality in homes with air levels at or below the NAS guideline level is probably not

warranted even though there is a risk to a small number of people of developing chronic health effects.

NPTN (1-800-858-7378) can give you additional background information on the health risks associated with a given air level of the cyclodienes.

Q What further steps can I take to reduce exposure?

A If you have followed suggestions for improving indoor air quality, have had the air in your house tested, and your air sample results are of concern to you, structural modifications may be useful to further reduce your exposure to the cyclodienes. For homes that have been properly treated, modifications are probably not worth the high expense. However, for homes with high airborne levels of cyclodiene residues resulting from misapplication, building modifications may be worthwhile. They should be designed on a case-by-case basis but may include replacing or relocating air ducts, replacing furnaces or ventilation systems with air exchangers, and/or sealing crawl space soil with a layer of concrete.

In cases where the cyclodienes have been improperly applied, household items may be contaminated. In these cases, clean or replace contaminated household items (such as carpets, carpet pads, and curtains).

Some authorities have suggested washing contaminated items several times with ordinary household detergents. However, information confirming the effectiveness of cleaning with detergents is not available. In cases of heavy contamination, as from a chemical spill, the National Institute for Occupational Health and Safety has recommended the use of certain chemical solvents for surface cleaning. These solvents can be hazardous when inhaled or allowed to contact the skin, and they should be used with caution. For specific information on these chemical solvents, call NPTN at 1-800-858-7378.

Q How can I find out how to dispose of unwanted chlordane or other termiticides?

A It is illegal to dump chlordane or other termiticides into sinks, toilets, storm drains, or any body of water. Proper disposal is necessary to prevent damage to fish and wildlife, public water supplies, and sewage treatment plants.

Disposal of any unused pesticide or its container must be done according to both the instructions on the label and state laws. Some local governments occasionally sponsor "clean-up days" to help people dispose of unwanted chemicals and chemical-contaminated items.

For clarification of label directions, or additional guidance, call NPTN at 1-800-858-7378, or contact your state pesticide or environmental control agency or a hazardous waste representative at the nearest EPA regional office.

Q What alternative termiticides are available?

A As of October 1987, five alternative termiticides were registered with EPA: chlorpyrifos (e.g., Dursban®), permethrin (i.e., Torpedo® and Dragnet®), cypermethrin (i.e., Demon®), fenvalerate, and isofenphos (i.e., Pryfon 6®, formerly Oftanol 6®). Chlorpyrifos and isofenphos are organophosphate pesticides. Permethrin, cypermethrin, and fenvalerate are synthetic "pyrethroid" pesticides. EPA has essentially complete health data bases on all five chemicals and has concluded that, when used according to label directions, they do not pose unreasonable risks. Though effective against termites, none of these chemicals has the demonstrated persistence of chlordane, heptachlor, aldrin, and dieldrin.

Q Is EPA planning further regulatory action on the cyclodiene termiticides?

A On August 11, 1987, EPA publicly announced that it is proceeding to cancel all registrations of aldrin and dieldrin. (Domestic production of both these chemicals ceased in the 1970s, and product manufacturers stopped importing these termiticides into the United States in 1985.)

On the same date, EPA also announced it had reached an agreement with the major manufacturer of chlordane and heptachlor (Velsicol Chemical Co.), which resolved EPA's principal concerns regarding continued use of these termiticides. Under the terms of this agreement:

- Velsicol immediately stopped its sales and distribution of chlordane and heptachlor termiticides. EPA will permit renewed marketing of chlordane/heptachlor products—for one or more specific application methods—*only* after Velsicol has conducted air-monitoring studies for each application method being considered, and *only* if such studies demonstrate that no detectable levels of chlordane/heptachlor are found in houses experimentally treated by a specific application method.

• Velsicol has cancelled those application methods that pose the greatest potential for misuse, and those application methods most likely to result in detectable indoor levels of chlordane/heptachlor. Methods that have been cancelled include applications inside a house or other structure, treatments using high-pressure injection rodding, and all applications underneath an existing structure.

Consumers should be aware of certain requirements established by EPA on October 1, 1987, governing the sale, distribution, and use of chlordane/heptachlor products registered by Velsicol. The following timetable applies to all Velsicol products that were already in channels of trade in August 1987, when Velsicol stopped its own sale and distribution of chlordane and heptachlor.

Through April 15, 1988, only certified pesticide applicators (or persons under their direct supervision) may purchase or use Velsicol products containing chlordane and heptachlor. Despite what uses are listed on the label, certified pesticide applicators may apply Velsicol chlordane/heptachlor products to *existing structures* only in outside, perimeter areas around homes or other buildings, using only low-pressure application techniques. Applications to *construction sites* (pre-construction treatments) are also permitted with some additional limitations.

After April 15, 1988, sale, distribution, and use of chlordane and heptachlor are prohibited. Chlordane/heptachlor products marketed by other manufacturers are unaffected by this decision and may continue to be sold and used.

Q How can I get more information?

A Call NPTN at 1-800-858-7378.

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