



TEXAS CENTER FOR RURAL STUDIES

Box 2618 • Austin, Texas 78768 • 512/474-0811

Comments before the Committee on Agriculture and Livestock on House Bill 1005; presented April 13, 1987 by Leslie Kochan, Texas Center for Rural Studies

My name is Leslie Kochan. I would like to thank the Committee on Agriculture and Livestock for this opportunity to comment on House Bill 1005. I am supporting this bill in behalf of the Texas Center for Rural Studies in Austin. The Center is a non-profit organization which conducts research and provides information to Texas residents concerned about pesticides and other toxic chemicals.

Regulatory and Standard Setting History

I would like to talk briefly about the regulatory history of chlordane, heptachlor, aldrin, and dieldrin, a class of chemicals known as the cyclodienes. On October 18, 1974, the Environmental Protection Agency (EPA) announced that most uses of aldrin and dieldrin were suspended. On March 6, 1978, EPA issued a final cancellation with a phase out period ending December 26, 1980 for chlordane and July 1, 1983 for heptachlor. Cancellation was based on findings that these chemicals were carcinogenic in rats and mice and toxic to wildlife.

The only use of these chemicals currently allowed is for termite control at structural sites via subsurface ground insertion and for dipping of tops of roots of non-food crops. The primary chemical currently used for termite control is chlordane in formulations which contain a smaller percentage of heptachlor so I will focus my comments on chlordane and to a lesser degree on heptachlor. EPA allowed continued use of the cyclodienes for subterranean termites under the assumption that no human exposure would take place under these conditions.

In 1979 following contamination of military housing with chlordane, the National Academy of Science (NAS) set guidelines for recommended evacuation based on indoor air levels of the cyclodienes, stating at that time that it "could not determine a level of exposure to chlordane below which there would be no biological effect under conditions of prolonged exposure." The levels set by NAS were 1 ug/m³ for aldrin and dieldrin, 2 ug/m³ for heptachlor, and 5 ug/m³ for chlordane and were based on a maximum of three years of exposure at that level.

NAS set these guidelines knowing that the risks of exposure at these levels was far greater than the one in a million or one in 100,000 usually accepted by government agencies for registration or continued use of a chemical. The cancer risk posed by lifetime exposure to 5 ug/m³ of chlordane in air ranges from 1.6 to 5.2 per 1,000 persons.

Current Problems in Texas

Now that I've provided some background on the cyclodienes, I want to discuss the problems with these chemicals which the Center has documented. Over the last year, we have identified over 20 incidents occurring between 1984 and 1986 and involving serious problems following termite treatments. In all of these cases the chemicals involved have been chlordane formulations. Our research indicate that these cases may represent only a portion of the problems which are actually occurring.

All of these cases have involved one or both of the following: the contamination of indoor air by termiticides at concentrations above those set by the National Academy of Science as guidelines for evacuation; and/or temporary or permanent relocation by residents as a result of acute and/or chronic health effects and concerns about future impacts to health. In at least 14 of these cases, air contamination levels were above NAS guidelines. In some cases, no air samples were taken. In at least 13 cases, residents temporarily or permanently left their homes or apartments. In at least 11 cases lawsuits have been filed.

Following contamination by termiticides, homes have been demolished or property sold with an agreement to destroy the house. Homes have been extensively renovated and homes have been sold with disclaimers at a significant loss. In some cases owners have boarded up houses and moved out hoping that levels of contamination will eventually go down, while in other cases owners continue to occupy homes they cannot afford to leave.

These cases are occurring in public places as well. Just last week the Structural Pest Control Board heard a case involving the misapplication of chlordane in and around a school and hospital in East Texas by a certified applicator and those under his supervision.

The Health Risks of the Cyclodienes

Now I would like to discuss why homeowners and others living in contaminated buildings are concerned enough about pesticide exposures to abandon their homes. The answer lies in the acute and chronic toxicity of these chemicals and their persistence once a home has been contaminated.

The chronic health effects of chlordane include central nervous system disturbances such as lethargy, tremors, disturbance of the optic nerve, and seizures. Residents who have been exposed to chlordane in residential settings have reported chronic health effects

including headaches, respiratory problems, gastrointestinal disturbances, dizziness, skin rashes, and personality changes.

Both chlordane and heptachlor have caused liver tumors in several strains of mice and rats. Other animal studies have indicated that chlordane is a tumor promotor, enhancing the ability of other carcinogens to cause cancer. Both positive and negative data exist on the mutagenicity of chlordane. Its metabolites have not been tested for their ability to cause mutagenic effects.

Chlordane and heptachlor present a high risk to the fetus and to infants due to their ability to bioaccumulate in human fat and breast-milk and to cross the placenta. A 1979-80 nationwide study found breakdown products of chlordane and heptachlor in 74 percent and 63 percent of the human breast milk samples taken from the lactating women who were surveyed. Women from the Southeast and Southwest (including Texas) were found to have the highest levels of these chemicals in their milk. The authors pointed to the heavier "use [of] pesticides in the home, lawn, and garden" and "a larger proportion of homes treated for termite control in the South" as reasons for these high levels. A recent study from the University of Hawaii found that a 1982 contamination of the Oahu milk supply with chlordane was linked to increased incidences of low-birth weight, premature birth, and perinatal jaundice among babies born to women who drank the milk during pregnancy.

An association has made between exposure of children to chlordane and malignant nerve tissue tumors, acute leukemia, and four other blood disorders. At least 55 cases of blood disorders have been linked to chlordane exposure.

Epidemiological studies which have examined the association between chlordane exposure and human health effects have generally been inconclusive or at least suggestive of a link between chlordane and human health effects. One study of 4000 pesticide applicators in Florida noted excess deaths from leukemia, lung, and brain cancers.

Knowledge of the chronic health risks of chlordane and heptachlor may permantly drive an individual or family out of a home. However, it is often the acute health effects which serve as the initial warning that there is something dangerous in the home environment. Acute health effects may include headaches, disorientation, muscle twitching and weakness, muscle incoordination and confusion, nausea, diarrhea, and in extreme cases liver and kidney damage, convulsions, ventricular fibrillation, and respiratory failure. No specific antidote is known to immediately mitigate these health effects.

Decontamination of Structures Contaminated by the Cyclodienes

Once contamination of a structure by any of the cyclodienes has occurred, it may be extremely expensive as well as impossible to remove these chemical residues. Chlordane and heptachlor are capable of penetrating most surfaces including food packaging materials. In many cases, neither treatment with detergents or strong solvents can remove residues. In 1974 the Office of the Surgeon General

reported that "Cleaning the surface -- did not result in a significant or predictable decrease -- apparently due to migration of chlordane from within -- as the tile surface is wiped clean, additional chlordane migrates to the surface." In 1982 Colonel Victor Furtado with the Surgeon General's Office stated "Once chlordane gets into the air of a house, it saturates everything, including -- floor surfaces, fabrics, drapes, carpets -- it's virtually impossible to get out."

Environmental Persistence of the Cyclodienes

The cyclodienes pose a risk to humans through outdoor environmental contamination as well as indoor contamination. All of the cyclodienes are extremely persistent in the environment and there is increasing evidence that residues of the chemicals are contaminating water systems and bio-accumulating in the environment. A 1985 study of fish contamination in Austin's Town Lake found detectable levels of chlordane in all fish species surveyed, with levels exceeding the action levels set by the Food and Drug Administration in two species. Earlier studies in 1982 discovered chlordane in Austin's runoff. Findings in other states are similar.

In New York, where more monitoring has been performed, at least 21 lakes and ponds contain fish contaminated by chlordane and chlordane has become a mortality factor in some of the state's birds. Dr. James Gillett, professor of ecotoxicology at Cornell University has stated "When the agricultural uses of chlordane were cancelled, I thought that the soil treatment use was still safe, simply because it was placed down far enough in the soil to avoid human exposure. ... Since the mid-70's, however, we have continued to see chlordane residues throughout the environment. The only remaining source of any consequence is its use as a termiticide"....

In Massachusetts, studies in 1978 and 1980 found residues or metabolites of chlordane in small and large mouth bass above the FDA action level. The New Jersey Department of Health released a study in 1983 which noted that 29 percent of the more sizeable fish taken from coastal marine waters exceeded the existing FDA tolerance level for chlordane. In February of this year, state officials in Missouri issued a health advisory, warning people not to eat a number of fish from the Missouri and Mississippi rivers due to high chlordane levels.

The Inadequacy of Current Regulations

As you can see, the federal government has allowed continued use of chemicals which have caused extensive economic damage, severe acute and chronic health effects, and have contaminated our outdoor environment.

Individual states have been forced to act. In 1985, the Texas Structural Pest Control Board, concerned about the high percentage of complaints associated with termiticides, began to require that all persons certified for termite control before May 1984 attend a training program on the use of termiticides before obtaining recertification in that category for 1985. Yet, complaints of

termiticide misapplications have not significantly decreased. House Bill 625, introduced by Rep. Harrison would require training and/or testing for all applicators. However, this will not guarantee that applications of chlordane are conducted properly. As illustrated by the school/hospital case I mentioned earlier, certified applicators as well as non-certified applicators are still misapplying termiticides.

New York took every step possible short of instituting a ban in an attempt to stop misuse of these chemicals. In 1984, the state eliminated the sales of chlordane to persons other than certified applicators, required every termiticide application to be performed by a certified applicator, and imposed further restrictions on the application of these pesticides. Despite these restrictions, misapplications of the cyclodienes continued to occur. New York also found that even when a misapplication was not known to have occurred, homes were being poisoned with chlordane. In 1982, New York began randomly sampling 515 houses and six non-residential settings for air levels of termiticides. Chlordane was detected in 82 percent of the indoor air samples (including basements and attics) and in 78 percent of the "living" areas. Approximately 32 percent and 6 percent of the samples from "nonliving" and "living" areas, respectively, were above NAS guidelines. New York placed an emergency ban on the cyclodienes in 1985. They were permanently cancelled this year.

Other air sampling has provided results similar to those of New York. In Massachusetts air sampling revealed chlordane levels above NAS guidelines, in various types of structures assumed to have been properly treated. Massachusetts cancelled the cyclodienes in 1986.

Alternatives to the Cyclodienes

So if chlordane is so bad, what are the alternatives? Some preventative measures can be taken to prevent termite infestations. These include the removal of scrap wood from around foundations and from under crawlspaces and attention to drainage problems, water leaks, and cracks that might provide a point of access and attract termites. The installation of vinyl or metal barriers pre-construction, or a layer of asphalt pre- or post-construction may deny access of termites to the wood of structures.

When serious termite infestation is a problem, a chemical alternative, Dursban, is preferable to chlordane for a number of reasons. Available data suggest that Dursban is not a reproductive toxin, teratogen, mutagen, or carcinogen. It also has a short biological half-life in blood and fat, assuming that multiple or continual exposure does not occur.

Dursban is more acutely toxic than chlordane. However, severe acute reactions can be treated with an antidote and Dursban is less volatile than chlordane, thus less likely to leave the soil and enter structures. It breaks down much more quickly than the cyclodienes under conditions of light and oxygen, thus if it does enter a structure it is likely to break down quickly. Unlike chlordane, Dursban can, in most cases, be removed if a structure is contaminated.

Field studies conducted by the USDA-Forest Service in Gulfport, Mississippi, have shown Dursban to be an effective termiticide in soil for the 18 years it has thus far been tested and chlordane for 36 years. On initial analysis, it would appear that chlordane would be effective for twice as long as Dursban. Experience in New York showed that this was not the case. Structures were found to be commonly reinfested within ten years of the initial treatment and sometimes retreatment was required as soon as one to two years after the initial treatment. The Center has talked to a number of individuals who report several complete retreatments within five years or less.

Dursban is slightly more expensive than chlordane which may encourage individuals to pay for structural modifications such as removal of termite infested areas or spot treatments rather than contracting for complete chemical treatments when not absolutely necessary.

Summary

In closing, I would like to note that in 1962, Rachel Carson warned in Silent Spring that DDT was turning up in unintended places such as mother's milk and dead birds. We now have a similar condition with chlordane, only its in our homes, schools, offices, and daycare centers as well. Continued exposure to any of the cyclodienes poses the risk of human damage from neurotoxicity, carcinogenicity, reproductive hazards, ecological impact, and the ability to bioaccumulate in tissues. Nothing short of a ban will protect the public's health. I urge this committee to give House Bill 1005 serious consideration.