

Dow
Chemical Findings
on
2,4-D

Golf Course Management
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Public reports, unverified scientifically, allege various human ailments to be caused by harmful exposure to the herbicide 2,4-D. This is a summary statement of key health and environmental issues involving 2,4-D. More in-depth discussions on each subject, documented by specific data, are included in the fact book "Public Concerns About the Herbicide 2,4-D."

HISTORY

The first reference suggesting the use of 2,4-D as a herbicide was published in 1944. The commercial introduction of 2,4-D by American Chemical Paint Company occurred that same year. The Oow Chemical Company supplied 2,4-D shortly thereafter for weed control applications.

MAJOR APPLICATIONS

Use % of Total Use

Weed control for:

Cereal crops (corn, wheat, barley) 50

Rangeland/pasture 25

Domestic lawns/turf 9

Utility rights-of-way 2

Forestry 2

Other (aquatic, golf courses, highways) 12

About 60 million pounds of 2,4-D are used in the United States annually.

SKIN ABSORPTION TOXICITY

Skin toxicity studies were conducted with laboratory animals under exposure conditions two to five times greater than the exposure expected from home or field use of 2,4-D. Results of the studies showed there were no significant adverse effects on the animals treated with 2,4-D concerning survival, body weight, blood composition and other parameters investigated.

A skin absorption study with human volunteers also showed little skin absorption of 2,4-D and no evidence of toxicity. Any 2,4-D entering the body would be rapidly excreted in the urine.

CANCER-CAUSING POTENTIAL

Chronic two-year studies on dogs and rats with varying dosages of 2,4-D, up to 125 mg/kg/day for dogs and 60 mg/kg/day for rats, showed that the herbicide is not carcinogenic. Three other studies on mice and rats involving oral exposure to 2,4-D and a fourth evaluation following skin exposure, all demonstrate the low chronic toxicity of 2,4-D and indicate that 2,4-D is not carcinogenic.

Seventy-five possible isomers exist in the chloro-dioxin family. The most toxic of these dioxin compounds is 2,3,7,8-TCDD. No 2,3,7,8-TCDD has been identified in any 2,4-D commercial formulation using an analytical method with a sensitivity of 1 ppb.

Other dioxin isomers that could be present in the herbicide 2,4-D have an acute oral toxicity that range from one million to 15,000 times less toxic than 2,3,7,8-TCDD. There has never been a demonstrated hazard to human health or the environment from the herbicidal use of any

phenoxy herbicides with a trace dioxin contaminant.

Detectable 2,4-D residues will generally last one to four weeks in warm, moist soil when the herbicide is used for control of weeds in agricultural applications. 2,4-D application for agricultural or industrial purposes is not causing an accumulation of the herbicide in our water supplies in amounts to cause a pollution problem.

BIRTH DEFECTS / REPRODUCTION

Three studies on rats and other experiments on sheep and hamsters involved exposures to various doses of 2,4-D at different stages of pregnancy. No effects on fertility, fetal growth and development were observed when comparing treated and control offspring; no teratogenic effects (true birth malformations) were observed which could be attributed to 2,4-D exposure.

Other experiments studying laboratory animal reproduction following exposure to 2,4-D showed no deleterious effects. These experiments demonstrate that pregnant animals can be exposed to relatively large amounts of 2,4-D, even during the most critical stages of pregnancy, without causing teratogenic effects in the offspring.

Extrapolation of data from animal to people reveals a high margin of safety. Even professional applicators

of 2,4-D need not be concerned about the possibility of 2,4-D causing birth defects in their offspring.

GENETIC EFFECTS

2,4-D is considered to be nonmutagenic based on studies with various species of experimental animals. There is also no experimental evidence to suggest that 2,4-D may damage the DNA molecule. The results of these tests indicate little likelihood that the use of 2,4-D presents any mutagenic hazard for people.