

2,4-D **Dichlorophenoxyacetic Acid**

General

2,4-D is a very popular lawn care pesticide in Canada and according to American manufactures, 2,4-Dichlorophenoxyacetic Acid (2,4-D) is the most widely used herbicide in the world.¹ It is sold under a variety of product names including numerous “weed and feed” lawn care products. A chlorinated phenoxy herbicide, 2,4-D is unique in that it causes a variety of different effects to the nervous system.

How It Works

2,4D is a growth inhibitor. It is absorbed into a plant through the plant’s surface. The weed killer circulates through all parts of the plant mimicking hormones called auxins which control numerous development and growth processes². It causes abnormal growth, blocking the passage of liquids and nutrients. Subsequently, the roots starve and the plant dies.³

Health Effects

In mammals, 2,4-D disrupts energy production⁴, depleting the body of its primary energy molecule, ATP (adenosine triphosphate)⁵ 2,4-D has been shown to cause cellular mutations which can lead to cancer. This mutagen contains dioxins, a group of chemicals known to be hazardous to human health and to the environment⁶.

Documented health problems relate to 2,4-D include reproductive damage(i.e. sterility), respiratory difficulties, atrophy, nausea, loss of appetite, skin rashes, eye irritation, and chronic headaches⁷. Non-Hodgkins lymphoma has also been associated with 2,4-D exposure⁸. Furthermore, there is evidence of teratogenicity (birth defects) and mutagenicity (mutation of cells) provided by studies involving 2,4-D and lab animals⁹.

Workers applying chlorinated phenoxy herbicides frequently have nervous system disorders, are exposed to a higher risk of soft tissue sarcoma, and show symptoms of hormonal and internal organ irregularities.¹⁰¹¹ A study of farmers in Alberta, Saskatchewan and Manitoba linked use of 2,4-D to an increased incidence of prostate cancer.¹²

In the urban setting, it has been proven that households using 2,4-D put their dogs at twice the risk of developing canine malignant lymphoma.¹³

These risks are elevated when one discovers that homeowners using 2,4-D are likely to track the pesticide into their home where it is expected to persist for up to one year.¹⁴

Environmental Effects

2,4-D is a moderately persistent chemical with a half-life between 20 and 200 days. Unfortunately, the herbicide does not affect target weeds alone. It can cause low growth rates, reproductive problems, changes in appearance or behaviour, or death in non-target species.

Additionally, the spraying of 2,4-D often, contaminates ground water systems because of its very high mobility in soils and weak binding to soil particles¹⁵. About 91.7% of 2,4-D will eventually end up in water.¹⁶ This contamination threatens the vegetation and the animal life that consumes

it. The chemical will also be carried by run-off into the local river systems, thereby jeopardizing the health of aquatic life as well.

Who Uses 2,4-D?

The pesticide is used primarily by cereal crop producers. The forestry industry uses 2,4-D to suppress the growth of hardwoods and undergrowth in conifer plantations. Another application of 2,4-D occurs along major rights-of-ways (i.e. railway tracks) to control brush. In urban areas 2,4-D is applied to control broad leafed weeds such as dandelions, ragweed, and poison ivy¹⁷. It is the active ingredient in readily available weed control mixtures, for example, killex.

Conclusions

The federal government is currently completing a final review of toxicological data for the pesticide 2,4-D. It states that there is contradictor information regarding the compounds carcinogenicity. This argument fails to realize that there has been cancer linked to this compound and the risk does exist. Is a lawn free of weeds worth the putting your dog, your child, your spouse or other loved one at an increased cancer risk?

References

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³ Littorin, M “Dioxins in Blood from Swedish Phenoxy Herbicide Workers.” In *Lancet* Vol.344 (8922), August 27,19994 pp.611-612.

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⁶ Littorin, M “Dioxins in Blood from Swedish Phenoxy Herbicide Workers.” In *Lancet* Vol.344 (8922), August 27,19994 pp.611-612.

⁷ Gopher://ecosys.drdr.VirtualLibrary/gen/toxins/2%2C4-D

⁸ Kogevinas, M. “ Soft Tissue Sarcoma and non-Hodgkins Lymponmain Workers exposed to phenoxy-herbicides, chlorophenols, and dioxins – 2 nested case studies.” In *Epidemiology*. Vol.6 (4) July, 1995. Pp.396-402

⁹Environment Canada Fact Sheet, “Pesticides :2,4-D, MCPA, Dichlorprop, Mecoprop”

¹⁰Kogevinas, M. “ Soft Tissue Sarcoma and non-Hodgkins Lymponmain Workers exposed to phenoxy-herbicides, chlorophenols, and dioxins – 2 nested case studies.” In *Epidemiology*. Vol.6 (4) July, 1995. Pp.396-402

¹¹Associate committee on Scientific Criteria for Environmental Quality; Subcommittee on Pesticides and Industrial Organic Chemicals. “2,4-D Some Current Issues” NRCC No. 20647. National Research Council of Canada, 1983. Pp. 29,55.

¹² Morrison, H. et al. 1993.Farming and Prostate Cancer Mortality. *American Journal of Epidemiology* 137(30):270-280

¹³Environment Canada Fact Sheet, “Pesticides :2,4-D, MCPA, Dichlorprop, Mecoprop”

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¹⁶ Gopher://ecosys.drdr.VirtualLibrary/gen/toxins/2%2C4-D

¹⁷Interdepartmental Executive Committee on Pest Management. “2,4-D Re-evaluation Update and Label Improvement Program.” Note to CAPCO C94-08. November 23, 1994.