

The lawn is safe

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[Junk Science](#), [Health Canada](#), [2, 4-D](#), [pesticides](#)

On Friday, May 16, Health Canada's Pest Management Regulatory Agency (PEMA) released its final reevaluation of 2,4-D, the leading pesticide in use in Canada. It was one of the most comprehensive science reviews in Canadian history, carried out exclusively by Health Canada scientists. Below are excerpts adapted from the PEMA report.



After a thorough reevaluation of the herbicide 2,4-dichlorophenoxy acetic acid (2,4-D), Health Canada's Pest Management Regulatory Agency (PMRA) has decided to allow continued registration for the sale and use in Canada of certain products containing 2,4-D.

Products containing 2,4-D do not pose unacceptable risks to human health or the environment. They also have value for lawn and turf, agriculture, forestry and industrial uses when used according to the label directions proposed in previous consultation documents.

What Does Health Canada Consider When Making a Re-evaluation Decision?

The key objective of the Pest Control Products Act is to prevent unacceptable risks to people and the environment from the use of pest control products. Health or environmental risk is considered acceptable if there is reasonable certainty that no harm to human health, future generations or the environment will result from use or exposure to the product under its conditions or proposed conditions of registration. The act also requires that products have value when used according to the label directions.

What is 2,4-D?

2,4-D is a selective systemic phenoxy herbicide that mimics the plant growth regulator indole-3-acetic acid (also known as auxin). It is registered for the control of broadleaf weeds, weedy trees and brush and aquatic weeds after they emerge. Use is permitted on fine turf, aquaculture (oyster farms), aquatic non-food sites, forests and woodlots (conifer release and forest site preparation), terrestrial feed and feed crops and industrial non-food sites (non-cropland).

Can Approved Uses of 2,4-D Affect Human Health?

2,4-D is unlikely to affect your health when used according to the revised label directions.

When assessing health risks, two key factors are considered: The levels at which no health effects occur and the levels to which people may be exposed. The dose levels used to assess risks are established to protect the most sensitive human population (e.g., children and nursing mothers).

Only those uses for which the exposure is well below levels that cause no effects in animal testing are considered acceptable for registration.

Reference doses define levels to which an individual can be exposed over a single day (acute) or lifetime (chronic) and expect no adverse health effects. Generally, dietary exposure from food and water is acceptable if it is less than 100% of the acute reference dose or chronic reference dose (acceptable daily intake). An acceptable daily intake is an estimate of the level of daily exposure to a pesticide residue that, over a lifetime, is believed to have no significant harmful effects. Human exposure to 2,4-D was estimated from residues in treated crops and drinking water, including the most highly exposed sub-population (e.g., children 1-6 years old).

What Is the Value of 2,4-D?

Today, 2,4-D is the third most widely used herbicide in Canada based on the amount of active ingredient applied. The use of 2,4-D reduces a portion of the economic losses incurred annually by weeds across Canada. Over the past 40 years, 2,4-D has played an important role in maintaining turf.

Without it, the number of broadleaf weed control products presently available to homeowners would be severely limited.

Most of the domestic class products used to control broadleaf weeds on lawns contain 2,4-D; there are few registered alternatives in Canada. 2,4-D

also controls a wide variety of broadleaf weeds in non-turf sites. It has long been recognized as being a superior tank mixing partner with other herbicides. These tank mixes control a broader range of weeds compared to products containing only a single active ingredient, resulting in fewer applications, less soil compaction and reduced costs for growers. 2,4-D is essential for managing groups of weeds resistant to other types of herbicides. After decades of use, there is little evidence of weeds developing resistance to this product.

Has the PMRA considered the ban of 2,4-D in Sweden and the associated decline in non-Hodgkins lymphoma (Hardell et al. 2003)?

2,4-D is no longer used in Sweden or Norway, and its use is severely restricted in Denmark. Environmental effects are cited as the primary reason for these actions as 2,4-D has the potential to enter groundwater, the primary source of drinking water in these countries. However, subsequent to these actions, the European Commission, upon completion of its re-evaluation of 2,4-D in October, 2001, concluded that 2,4-D was acceptable for continued registration.

A number of other epidemiology studies (both independent and industry-funded) from the U.S., New Zealand and Australia report no association between 2,4-D and soft-tissue sarcoma, non-Hodgkin's lymphoma or Hodgkin's lymphoma (Smith et al. 1983, Hoar et al. 1986, Woods et al. 1987), and more recent studies have not shown an association between 2,4-D and non-Hodgkin's lymphoma or other cancers (e.g. Asp et al. 1994, Lynge 1998, Burns et al. 2001). Several major scientific panels have evaluated this body of research and have described the evidence for cancer effect in humans as limited, inconclusive, inconsistent and weak.

Various studies report an association between 2,4-D use and breast cancer. Did the PMRA consider these studies in their assessment?

The PMRA examined relevant health-related studies during its evaluation of 2,4-D and reviewed the references provided with this comment. Mills et al. (2005) is an epidemiological case-control study for breast cancer in Hispanic agricultural workers in California. Study results indicate there is no associated increase in breast cancer incidence when all potential chemical exposures were combined. In fact, an increase in chemical uses

was actually associated with a decreased incidence of breast cancer. Also, confounding factors such as smoking, previous residence, drinking, diet and family history were not taken into consideration.

How is 2,4-D related to Agent Orange?

Agent Orange was a mixture of 2,4-D and a second herbicide, 2,4,5-T. However, the chemicals used for Agent Orange, and their contaminant levels, were not the same as those commercially available at the time, or since. With the refined manufacturing processes that have been imposed by federal regulatory bodies over the years, contamination of 2,4-D with dioxin levels of concern is not expected. 2,4,5-T was found to be contaminated with 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) at levels much higher than ever seen in 2,4-D. 2,4,5-T was withdrawn from the market in the early 1980s, in part, because of concerns with dioxins. There is no indication of widespread neurological effects in the extensive 2,4-D toxicology database. While certain pesticides, such as specific carbamate and organophosphate insecticides, inhibit acetylcholinesterase (AChE), this is not a typical endpoint of concern associated with herbicides such as 2,4-D.

Renu Gandhi, of Cornell University's Breast Cancer and Environmental Risk Factors program, recanted the position that 2,4-D is not known to cause cancer in a 2001 Fact Sheet entitled Pesticides and Breast Cancer Risk: An Evaluation of 2,4-D.

There is no indication that Gandhi recanted his position on 2,4-D and cancer in the 2001 update of his paper. As in 1998, Gandhi states, "There are no reports that indicate a direct link between 2,4-D exposure and cancer in humans." While there is concern with respect to non-Hodgkin's lymphoma, "results from different studies are not consistent. While one half of the studies indicated higher rates of non-Hodgkin's lymphoma among populations exposed to 2,4-D, the other half did not."

Japanese researchers reported in 2005 that 2,4-D exerts both estrogenic and androgenic effects in rainbow trout. These effects may lead to health outcomes as diverse as precocious puberty, obesity and diabetes, and cancers.

The concentrations used in the Japanese study are extremely high and not relevant to concentrations typically found in the environment. Based on present-day standards, no evidence for effects on the endocrine system were noted in the 2,4-D toxicology database.

We should not trust industry-sponsored studies.

All pesticide applicants are required to develop a comprehensive database of information that is critically assessed by the PMRA's scientists to determine if and under what conditions of use a pesticide will pose no harm to environmental and human health. The studies the applicants submit must be conducted in compliance with internationally accepted study protocols. Scientists and regulators design these protocols to produce scientifically valid data. Countries including Canada, the United States, European Union and other members of the Organization for Economic Cooperation and Development (OECD) have harmonized data requirements and study protocols. These studies are conducted by industry or in industry-contracted laboratories and they must be in compliance with good laboratory practice. This ensures in-depth documentation of study conduct and the results produced. Compliance with good laboratory practice gives regulators the ability to audit laboratories, data and study samples to ensure their reliability.

The PMRA scientists can and do reject studies that are deemed to be deficient, that unjustifiably deviate from established study protocols or for scientific issues that affect the ability to interpret the data. The studies industry submits to the PMRA are generally of very high quality. In contrast to published scientific studies, which the PMRA also examines, industry-sponsored studies often include raw data. This translates into thousands of pages of data for a given compound, which undergo thorough analyses and cross-checking between studies to ensure data consistency. As a result of the evaluation of data industry submitted to the PMRA, the PMRA can also request additional data to address concerns arising from the evaluation.

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Excerpted from Health Canada's Re-evaluation Decision, (2,4-Dichlorophenoxy) acetic Acid [2,4-D], May 16, 2008.

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