

INDUSTRY TASK FORCE II ON 2,4-D RESEARCH DATA

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QUESTIONS AND ANSWERS ABOUT THE HERBICIDE 2,4-D*

1. *What are some of the key EPA findings concerning 2,4-D reregistration?*

After examining the combined risk from exposure through food, drinking water and residential uses, with certain assumptions, using all the required safety factors, EPA concluded that 2,4-D would “not exceed” the Agency’s level of concern. Additionally, the Agency concluded that short-term margins of exposure for homeowner applications to lawns were “not of concern”.

- For additional information, see Issue Backgrounder “[EPA Reregistration Eligibility Decision ‘RED’](#)”.

2. *What is the EPA’s position on 2,4-D and cancer?*

“The Agency has twice recently reviewed epidemiological studies linking cancer to 2,4-D. In the first review, completed January 14, 2004, EPA concluded there is no additional evidence that would implicate 2,4-D as a cause of cancer. The second review of available epidemiological studies occurred in response to comments received during the Phase 3 Public Comment Period for the 2,4-D Reregistration Eligibility Decision. EPA’s report, dated December 8, 2004 and authored by EPA Scientist Jerry Blondell, Ph.D., **found that none of the more recent epidemiological studies definitively linked human cancer cases to 2,4-D.**”

3. *What safety factors does EPA use in their pesticide evaluations?*

Various safety factors are added to the “no effect level” (NOEL) of the most sensitive animal species tested over that animal’s lifetime. The no effect level is the dose given to the test animals over their lifetimes, which demonstrates no effect on the animal. A 100X safety factor, or 100X Margin of Exposure (MOE) below the no effect level, is routinely built into the risk assessment. This is based on a 10X safety factor for inter species (animals to man) and a 10X safety factor for intra species, which takes into consideration children and ethnic groups. Then an additional 10X uncertainty factor has been added to take into consideration new study requirements. This results in a 1000X Margin of Exposure factor used in EPA’s pesticide risk assessments.

* 2,4-dichlorophenoxyacetic acid

4. Why 17 years for reregistration?

Higher priorities were placed on compounds of greater concern. Given its 60 years of widespread use, potential human health and environmental effects of 2,4-D are well understood. Therefore, regulators in the U.S. and elsewhere placed their reregistration priority on other compounds.

5. Why has IARC has classified 2,4-D as a 'possible' carcinogen?

Understanding the basis and context of IARC's (the International Agency for Research on Cancer) classification is critical to the full understanding of this important topic. The IARC review of the chlorophenoxy herbicides (which includes 2,4-D and others) was first conducted in 1977 and is based on data collected in the late 1960s and early 1970s. It is important to note that the human carcinogenicity potential of 2,4-D was not and never has been fully evaluated by IARC.

The updated Monograph published in 1987 concluded that chlorophenoxy herbicides *as a group* were classified as Group 2B or "possible" carcinogens for increased occupational cancer risk in pesticide applicators (e.g. lawn care applicators and farmers). Because 2,4-D belongs to this chlorophenoxy group of substances, the compound was given the same classification, in the absence of data that would make a full evaluation of the individual substance possible. A limitation that is recognized in the footnotes of the Monograph, which state:

"This evaluation applies to the group of chemicals as a whole and not necessarily to all individual chemicals within the group".

In 1996 IARC's parent organization, the World Health Organization, completed a comprehensive review of 2,4-D and concluded, "There was no evidence of carcinogenicity" in all 2,4-D animal feeding studies.

- For additional information, see Issue Backgrounder "[IARC Classification of Chlorophenoxy Herbicides](#)".

6. Is 2,4-D is an endocrine disruptor?

The major focus around endocrine disruptors has been on synthetic chemicals including pesticide active ingredients (e.g. 2,4-D) or pesticide formulants. However, recently published scientific studies demonstrate that synthetic chemicals tested are only weak estrogen mimics, while other sources of natural estrogens (resulting from human waste treatment plants or animal manure use) are orders of magnitude more active and have been shown to have environmental impacts. There is currently no scientific consensus regarding endocrine modulators or their impact on human health or the environment.

Unlike alleged endocrine disruptors, 2,4-D is not persistent in the environment, having a half-life of about seven days. It eventually breaks down to carbon, carbon dioxide and a trace amount of chlorine – all of no toxicological significance. 2,4-D does not accumulate in the body, does not metabolize, is excreted in the urine unchanged, and is not a mutagen or carcinogen.

7. Does 2,4-D cause cancer (*Canine Malignant Lymphoma*) in dogs?

No. All agencies that have examined the scientific data have reached the same conclusion: 2,4-D does not cause cancer in animals.

A 1991 article by a former researcher at the National Cancer Institute (NCI) suggested a link between dogs with CML and dog-owners that applied 2,4-D to their lawn. An independent panel concluded in 1992 that the study design was severely flawed and, in fact, did not show an association between CML and 2,4-D use. In 1999, scientists at the School of Veterinary Medicine at Michigan State University re-examined the NCI data and also concluded that there was no relationship between 2,4-D use and CML:

“The weight of this evidence, combined with the lack of any indicators for lymphoma in short- and long-term dietary studies in dogs, indicates that the original report of an association between homeowner use of 2,4-D and CML cannot be substantiated or supported.”

- For additional information, see Issue Backgrounder “[Cancer in Dogs](#)”.

8. Most studies of 2,4-D use rats to test for toxicity. It has been proven that rats have a gene which allows them to detoxify themselves, that is why they can live in environments humans cannot. Studies based on rat experiments are no longer viable.

Rats are only one species used in the toxicology studies. Decades of historical use of rats, mice and rabbits have proven to be the best laboratory animals to represent the human toxicological response. Additionally, animals used in laboratory studies are bred from very specific pedigreed lines to maintain a consistent controlled animal source for testing purposes.

More importantly however, regulatory decisions are not based on toxicology alone. Human epidemiological studies in conjunction with toxicology studies provide researchers and regulators with a more complete picture of health risks and effects.

9. *2,4-D was an active ingredient in Agent Orange. Even though Agent Orange has been banned for years, 2,4-D is still on the market today.*

2,4-D is not Agent Orange.

2,4-D was a component of Agent Orange, along with another phenoxy, 2,4,5-T. 2,4,5-T was the compound of concern for dioxin contamination and was discontinued more than 20 years ago (production and registration).

10. *Young children are the most vulnerable to pesticide exposure, as pesticides are known to cause diseases like ADHD, Leukemia, and non-Hodgkin's lymphoma.*

All regulators take into special consideration the potential exposure of children to pesticides. Thorough scientific assessments, including safety factors and risk assessments for potential effects including cancer, birth defects, reproductive effects and pre- and post natal developmental effects are considered.

The EPA and other pesticide regulatory agencies have determined 2,4-D does not cause cancer and can be used safely by homeowners who choose to use it on their lawns when label directions are followed. Not one national or international regulatory body considers 2,4-D to be a human carcinogen.

11. *Some reports claim children are more susceptible to pesticides due to their behavior and unique physiological characteristics.*

Specific risk assessments for children, taking into consideration their unique physiology, diets, behaviors and play-habits, such as their body weight and hand-to-mouth contact while playing on treated grass, are undertaken before a pesticide is granted a registration.

12. *Should I be concerned about exposure to 2,4-D from track-in residues into my home?*

No. A risk assessment conducted for adults and children exposed to 2,4-D as a result of playing on recently treated turf, considered the combined oral and dermal exposure and indicated no unacceptable risks. Since the levels of 2,4-D that have been measured in house dust are much lower than the concentrations on soil and turf, for which no concern was identified, the potential exposure from 2,4-D residues inside the home is not a cause for concern.

As well, 2,4-D is not considered to be persistent on turf. Studies over the past 50 years from both industry and independent sources show that 2,4-D residues on turf decline rapidly.

13. Are Bystanders to turf applications exposed to 2,4-D?

Several researchers at the University of Guelph have completed studies on human exposure to applications of 2,4-D. These studies show the highest observed exposures for homeowners and commercial applicators were well below the lifetime ADI (acceptable daily intake) as established by the WHO. The most recent research demonstrates that there were no detectable exposures for the bystanders who resided in homes of homeowner or commercially treated lawns or for barefoot, barelegged bystanders who actively walked or sat on turfgrass for one hour on the day of spraying.

14. Is exposure to the odor of 2,4-D hazardous?

Pure 2,4-D is odorless. Odor associated with the application of 2,4-D comes from a small amount of the primary breakdown product, 2,4-dichlorophenol (DCP). Another odor may come from a small amount of dimethylamine, a neutralizing agent of the 2,4-D formulation. Both of these compounds are considered extremely low toxicity as a vapor, although low levels are quite odorous. Government agencies have indicated low toxicological concern for inhalation of 2,4-D. Odor exposure is not of toxicological concern.

15. 2,4-D is banned in some countries like Sweden, why?

2,4-D is not banned in Scandinavian countries such as Sweden. In point of fact, the European Commission approved the use of 2,4-D for all EC member countries in 2001, which includes Sweden. The largest use of 2,4-D is on cereal crops such as wheat and corn in central and southern Europe, and the small market in northern countries does not justify the expense of obtaining and maintaining a registration.

16. Regulatory agencies base their decisions on “secret studies” paid for by the pesticide industry.

The Task Force did not conduct a single research study of the more than 300 Good Laboratory Practices (GLP) studies required by the U.S. Environmental Protection Agency (EPA) and Health Canada Pest Management Regulatory Agency (PMRA) for the reregistration/re-evaluation of the herbicide 2,4-D.

Regulatory decisions regarding 2,4-D are based on an enormous body of research that has been conducted by some 30 EPA GLP accredited laboratories in concert with studies and reports published in scientific journals, as well as other foreign nations’ and international organizations’ reviews.

- For additional information, see Issue Backgrounder “[Industry Good Laboratory Practice \(GLP\) Research](#)”.

17. Does 2,4-D persist in the soil?

Soil dissipation of 2,4-D is well understood. The recent data from 30 soil dissipation studies on various soil types around North America illustrate a median 2,4-D half-life of 5.6 days. This agrees with the laboratory aerobic soil metabolism half life of 6.2 days. 2,4-D is classified as non-persistent to slightly persistent in soil and natural water because of aerobic microbial biotransformation.

18. What are the restrictions for using the 2,4-D treated water following a surface or subsurface aquatic application?

Except for a waiting period of 24 hours for swimming after the applying the ester, 2,4-D BEE, there are no restrictions on using water from treated areas for swimming, fishing, watering livestock or domestic purposes after using 2,4-D acid, amine or salt forms.

19. Should 2,4-D be a concern for groundwater contamination?

No, the rapid breakdown of 2,4-D minimizes the potential for movement in soil, and greater than 90 - 95% dissipates in the top six inches of soil. Eventually 2,4-D breaks down to CO₂ and is integrated into other carbon compounds in the soil. Any findings of 2,4-D in ground water have been extremely rare. These have been attributed to spot contamination or spills near water wells or unique soil conditions with high rainfall or irrigation shortly following application.