

## U.S. EPA, Reregistration Eligibility Decision (RED)

### UNITED STATES ENVIRONMENTAL PROTECTION AGENCY ISSUES REREGISTRATION ELIGIBILITY DECISION ON THE HERBICIDE 2,4-D

The Environmental Protection Agency (EPA) issued its comprehensive environmental and human health assessment of the herbicide 2,4-D, under the Agency's reregistration program of older pesticides. 2,4-D is a phenoxy herbicide discovered sixty years ago and used today worldwide in a variety of applications in agricultural, noncropland, residential, and aquatic settings. Currently over 600 end-use products are registered for use on over 300 distinct sites.

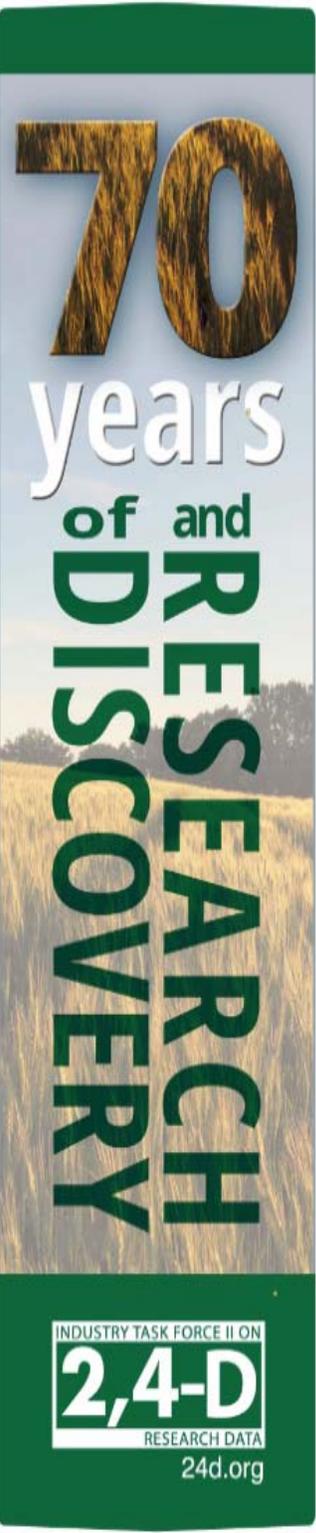
After examining the combined risk from exposure through food, drinking water and residential uses, with certain assumptions, the EPA concluded that 2,4-D would "not exceed" the Agency's level of concern. In addition, the EPA concluded that acute and short-term margins of exposure for homeowner applications of 2,4-D to lawns were "not of concern" when users follow product instructions.

#### Background:

The EPA's announcement and release of its Reregistration Eligibility Decision (RED) on 2,4-D completed a 17-year EPA review process. EPA's 2,4-D decision document concluded that 2,4-D does not present risks of concern to human health when users follow 2,4-D product instructions as outlined in the RED document. Over the course of 17 years, the Industry Task Force II on 2,4-D Research Data developed and submitted to EPA over 300 Good Laboratory Practice (GLP) toxicology, environmental and residue studies which EPA scientists reviewed to assess the herbicide's safety under the Federal Insecticide Fungicide and Rodenticide Act (FIFRA) and the Food Quality Protection Act (FQPA).

The EPA's assessment of the human and environmental scientific data reinforces a growing number of regulatory decisions and expert reviews that conclude the use of 2,4-D according to label instructions does not present an unacceptable risk of concern to human health or the environment. EPA's comprehensive findings are consistent with decisions of other authorities such as the World Health Organization, Health Canada, European Commission and recent studies by the U.S. National Cancer Institute on 2,4-D.

The EPA's RED assessment included a review of animal and human data, the latter in the form of epidemiology studies.



## Key Elements of the RED

EPA's position on various risk assessment elements:

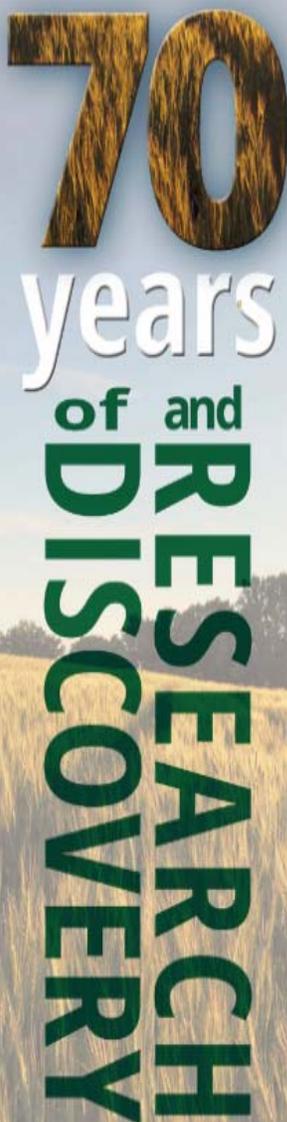
**Human Carcinogenicity:** "The Agency has twice recently reviewed epidemiological studies linking cancer to 2,4-D. In the first review, completed January 14, 2004, EPA concluded there is no additional evidence that would implicate 2,4-D as a cause of cancer (EPA, 2004). The second review of available epidemiological studies occurred in response to comments received during the Phase 3 Public Comment Period for the 2,4-D RED. 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."

**Dietary Risk:** "Acute and chronic dietary exposures for food and drinking water do not exceed the Agency's level of concern; therefore, no mitigation is warranted at this time for any dietary exposure to 2,4-D."

**Residential Risk:** "In preliminary versions of the risk assessment, when considered alone, acute and short-term residential risks posed by the use of 2,4-D were not of concern to the Agency; however, when considered as part of an aggregate exposure with food and drinking water, exposures did exceed the Agency's level of concern. As a result, 2,4-D registrants agreed to reduce the maximum application rate to turf and residential lawns from 2.0 lbs ae/A to 1.5 lbs ae/A. Chronic residential exposures to 2,4-D are not expected due to its use pattern."

**Aggregate Risk:** "In the preliminary and revised risk assessments, the estimated acute and short-term exposures exceeded the Agency's level of concern. As a result, 2,4-D registrants agreed to reduce the maximum application rate to turf and residential lawns from 2.0 pounds acid equivalent per acre (lbs ae/A) to 1.5 lbs ae/A. The current risk assessment considers exposures from the reduced application rate for residential turf."

**Occupational Risk:** "With the exception of mixing/loading wettable powder, all of the short-term and intermediate-term MOEs exceed the target of 100 with baseline personal protective equipment (PPE) (i.e., long-sleeved shirt, long pants, shoes plus socks, no respirator) or single layer PPE (i.e., long-sleeved shirt, long pants, shoes plus socks, gloves, no respirator) and are not of concern. The MOEs for handling wettable powder are above 100 with engineering controls (i.e., water soluble bags)."


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**Toxicity:** “With very few exceptions, the effects and relative toxicities of the salt and ester forms of 2,4-D are quite similar to those of the acid form. Thus, the acid form was selected as being representative of all members of the 2,4-D reregistration case (Case No. 0073). The member chemicals in the 2,4-D case exhibit low to slight acute toxicity with the exception of the acid and salt forms being severe eye irritants. The Agency has reviewed all toxicity studies submitted for 2,4-D and has determined that the toxicological database is sufficient for reregistration.”

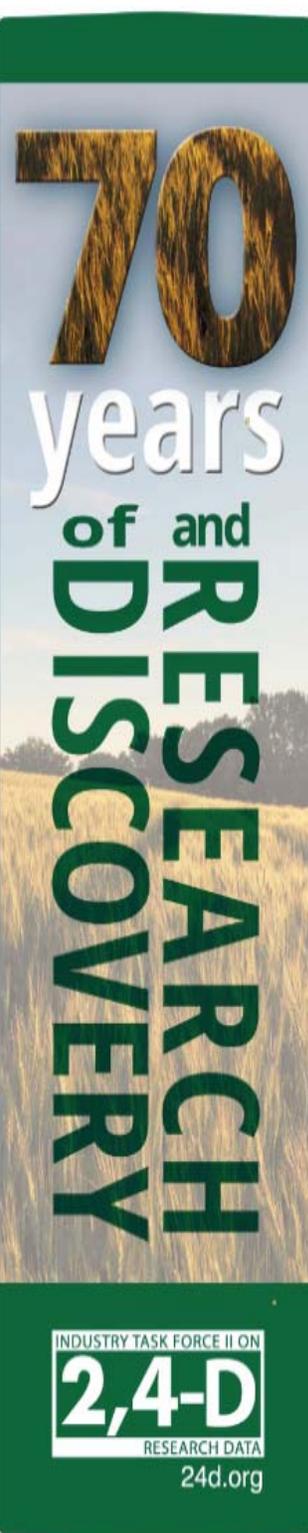
**Mutagenicity:** “Based on the overall pattern of responses observed in both in vitro and in vivo genotoxicity tests, 2,4-D was not mutagenic, although some cytogenic effects were observed. 2,4-D acid is currently considered to be representative of all nine member chemicals of the 2,4-D case.”

**Dermal Absorption:** “With respect to dermal exposures, the Agency previously selected a dermal absorption factor of 5.8 percent based on the average absorbed dose value from a human dermal absorption study. That factor (5.8 percent) was used in previous versions of the human health risk assessment. Based on comments received during the Phase 5 comment period, the dermal absorption study and resulting absorption factor were reconsidered. In order to account for the variability observed in the dermal absorption study, the dermal absorption factor was changed from 5.8 percent to 10 percent. In their “Re-evaluation of the Lawn and Turf Uses of 2,4-D,” which was made available to the public for review, Health Canada also selected a factor of 10 percent based upon the weight of evidence from several published studies, taking into account the variability in the data and the limitations of the various studies.”

**Ecological Risk:** “The measures to control spray drift are expected to reduce the risk of 2,4-D to non-target plants. Maximum turf rate is reduced from 2.0 lbs ae/A to 1.5 lbs ae/A. Implementation of the application rates set forth in the Master Label will reduce rates (as compared to current rates on existing labels) for field corn, popcorn, sweet corn, small grains, fallowland/stubble, noncropland, turf, aquatic applications (surface), pasture, and soybean.”

**Short Term Risk Assessments for Residential Handlers:** The Margins of Exposure (MOE) for various residential applications ranged from 1,800 for hose-end sprayers to 29,000 for fertilizer/herbicide granular mixtures. An MOE exceeding 1,000 is “not of concern.”

The RED states that additional data requirements relating to toxicology and environmental fate are required:



Developmental neurotoxicity study (DNT);

Multigeneration reproduction study (Repro);

Subchronic inhalation toxicity study (28 day);

Non-target terrestrial plants -TEP acid/amine and ester tests;

Crop residue field trial: wheat hay; and,

Irrigated crop studies: strawberries, and sugar beet tops and roots.

As of Feb. 2010 all data requirement or data gap studies have been submitted

### About the Herbicide 2,4-D:

The original patent on 2,4-D was issued in 1945 to Dr. Franklin D. Jones, a plant physiologist. Dr. Jones was working with the naturally occurring plant auxin, indole acetic acid (IAA). IAA is present in all plant matter and humans ingest it daily whenever fruit, vegetables and cereals are consumed. In an effort to work with a more chemically stable, auxin-like compound, Dr. Jones included 2,4-D, an analog of IAA, in his experiments.

2,4-D, one of the most widely used herbicides in the U.S. and worldwide, is applied to crops such as wheat, corn, rice, soybeans, potatoes, sugar cane, pome fruits, stone fruits and nuts. It controls weeds in turf grass and invasive species in aquatic areas and federally protected areas.

In 2004, The Henry Ford organization in Dearborn, Michigan identified 2,4-D as one of the 75 most important innovations in the previous 75 years. Few scientific innovations have done as much to increase food production throughout the world.

### About the Task Force

The Industry Task Force II on 2,4-D Research Data is organized to provide funding for the on-going Good Laboratory Practice (GLP) research studies required to respond to the US EPA registration review and PMRA pesticide re-evaluation programs. The 2,4-D Task Force is comprised of those companies holding technical 2,4-D registrations: Dow AgroSciences (U.S.), Nufarm, Ltd. (Australia) and Agro-Gor Corp., a U.S. corporation jointly owned by Albaugh, LLC. (U.S.) and PBI-Gordon Corp. (U.S.).

March 17, 2016

