

Chlorothalonil and 4-Hydroxychlorothalonil and Water

Chlorothalonil is a fungicide used on crops like peanuts, potatoes, tomatoes, turfgrass, ornamentals, and home garden fruits and vegetables. It is also used in materials such as paints, stains, and adhesives. In 2021 the Minnesota Department of Agriculture (MDA) noted in their nomination correspondence that approximately 450,000 pounds of chlorothalonil were sold in Minnesota. 4-Hydroxychlorothalonil is a major degradate of chlorothalonil.

The Minnesota Department of Health (MDH) Risk Assessment Unit evaluates health risks for contaminants in drinking water and develops health-based guidance values for groundwater.¹ The toxicological summary for chlorothalonil can be found at the MDH Human Health-Based Water Guidance Table website.² MDH works in collaboration with the Minnesota Pollution Control Agency and the MDA to understand the occurrence and environmental effects of these contaminants.

Chlorothalonil in Minnesota waters

Chlorothalonil has been detected a few times in ambient Minnesota groundwater and surface water, but detections were below the available MDH water guidance values. In 2021, MDA found 4-hydroxychlorothalonil in 10% of 223 Minnesota groundwater samples at a maximum concentration of 4.6 µg/L, above the 2023 risk assessment advice (RAA) value. RAA is technical guidance concerning exposures and risks to human health for chemicals where available information is more limited.

MDH guidance value

MDH developed health-based guidance values (HBV) for chlorothalonil of 1 µg/L and RAA value of 2 µg/L for 4-hydroxychlorothalonil according to the duration of exposure.

MDH develops guidance values based on available epidemiological, toxicological, and exposure information to protect people, including people who may be more sensitive to chemical exposure, from the potentially harmful effects of a contaminant. A person drinking water at or below the guidance value would be at little or no risk for harmful health effects.

Potential health effects

Animal studies indicate exposure to chlorothalonil may impact the gastrointestinal, liver, and kidney systems in the body and may increase the risk of certain kinds of cancer. Exposure to 4-hydroxychlorothalonil affected development in rats and rabbits. The United States Environmental Protection Agency classifies chlorothalonil as “likely to be carcinogenic to humans.”³

Potential exposure to chlorothalonil and 4-hydroxychlorothalonil

While drinking water is a potential route of exposure to chlorothalonil and 4-hydroxychlorothalonil, most people are exposed to these chemicals through their diet. Residues

of these chemicals may be present in raw and processed foods. An analysis by the U.S. Environmental Protection Agency (EPA, 2020) found that some individuals may be exposed to chlorothalonil at levels that equal or exceed the MDH toxicological reference dose.

Chlorothalonil and 4-hydroxychlorothalonil in the environment

Chlorothalonil enters the environment through its use as a pesticide. Chlorothalonil is moderately persistent in soil and slightly mobile in water.³ 4-Hydroxychlorothalonil is more mobile and persistent than chlorothalonil.

References

1. Minnesota Department of Health (2022). Health-based Guidance Development Process. <https://www.health.state.mn.us/communities/environment/risk/guidance/devprocess.html>
2. Minnesota Department of Health (MDH). (2023). Human Health-Based Water Guidance Table. "Toxicological Summary for: Chlorothalonil." <https://www.health.state.mn.us/communities/environment/risk/docs/guidance/gw/chlorothlnil.pdf>
3. United States Environmental Protection Agency (EPA). (1999). Drinking Water Standards and Health Advisories Table. https://www3.epa.gov/pesticides/chem_search/reg_actions/reregistration/fs_PC-081901_1-Apr-99.pdf.

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July 2023

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