

HEALTH FACTS



Lurking in the Weeds: A Lawn Care Pesticide Threatens Health and is Poised to Get Worse

A World War II-era weed killer, 2,4-D, is one of the top three largest selling pesticides in North America today, despite dozens of scientific studies that link this pesticide to lymphoma, cell damage, hormonal disruption, and reproductive problems. Once a chief ingredient in Agent Orange, 46 million pounds of 2,4-D are still used every year in the United States alone, applied to lawns, playgrounds, golf courses, and millions of acres of agricultural land. 2,4-D contaminates our air and water and finds its way into our homes tracked in by shoes and pet paws. The application of toxic 2,4-D will dramatically increase if new genetically modified (GMO) corn and soybean crops are approved, putting thousands more Americans at risk. The Environmental Protection Agency (EPA) should restrict use of 2,4-D and the U.S. Department of Agriculture (USDA) should not allow new "2,4-D Ready" crops on the market.

HOW 2,4-D MAKES ITS WAY INTO OUR AIR, WATER, AND HOMES

Numerous scientific studies have demonstrated that 2,4-D applied outdoors is commonly tracked into homes on shoes or pet paws, where it barely degrades because it is not exposed to direct sunlight. Once inside your home, 2,4-D can remain in carpets for as long as a year. 2,4-D was found in 83 percent of household dust samples in North Carolina and 98 percent of homes sampled in Ohio in a 2008 study of 135 homes, despite the fact that only one homeowner in the study reported recent use of the pesticide. 2,4-D has been found as a contaminant in our lakes and streams, and has also been detected in groundwater, according to the United States Geological Survey. More concerning for people however, is that 2,4-D has been widely detected in drinking water. The wind can also pick up 2,4-D, carrying it for miles from the point of application where it then contaminates more soil and water.

Anyone who applies 2,4-D, or is in contact with lawns or surface water where 2,4-D was applied, may be at risk of exposure to the pesticide. Numerous studies have shown that 2,4-D is absorbed through the skin. Although under normal conditions, less than 10 percent of 2,4-D that comes in contact with skin is absorbed, there is extensive evidence

Where 2,4-D is Used

2,4-D (2,4-dichlorophenoxyacetic acid) is the most commonly used conventional pesticide in the home and garden market. Weed killers containing 2,4-D are sold to homeowners in "Weed and Feed" products for use on their lawns. The chemical is also used to control aquatic weeds in water where people may swim and on athletic fields, golf courses, and playgrounds. Agricultural uses of 2,4-D include application to pasture and timber land, wheat, corn, soybeans, barley, rice, oats, and sugar cane. New 2,4-D resistant GMO soybeans and corn will allow farmers to spray much more 2,4-D on their fields without worrying about damaging the crop. This will increase damage to other crops downwind, and to people's vegetable gardens. It will also increase contamination of water and soil, and increase human health risk.

that absorption of 2,4-D is doubled or tripled when there is sunscreen or DEET (a common insect repellent ingredient) on the skin. In addition, alcohol ingestion doubles the rate of skin absorption of 2,4-D. The effects of alcohol ingestion and sunscreen application are multiplicative, resulting in very substantial increases in skin absorption of 2,4-D.



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2,4-D IS LINKED TO CANCER

Over the past 40 years, dozens of studies have been published on the links between 2,4-D and non-Hodgkin's lymphoma, as well as soft-tissue sarcoma in humans. In 2010, approximately 65,540 people in the United States were diagnosed with non-Hodgkin's lymphoma. The rate of this disease in the United States nearly doubled since the 1970s, even when adjusted for population size and age. It is reasonable to conclude that 2,4-D is likely a contributing factor to cases of non-Hodgkin's lymphoma. Many studies have found that 2,4-D products are cytotoxic (i.e., damage and kill cells) and mutagenic (i.e., trigger genetic mutations). In human lymphocytes, commonly known as white blood cells, which are the cells that have become cancerous in people with lymphoma, 2,4-D also causes chromosome breakage and abnormal cells. Studies in farm workers have found that 2,4-D exposure causes increased proliferation of white blood cells. These findings could explain the connection to lymphoma.

Researchers have found higher rates of certain birth defects in areas with the highest use of 2,4-D and other herbicides of the same class.

2,4-D AFFECTS REPRODUCTIVE HEALTH IN MEN AND WOMEN

Studies have also shown that 2,4-D enters maternal milk and even semen. Dozens of peer-reviewed studies show that 2,4-D exhibits hormone-disrupting activity, including estrogenic, androgenic, and anti-thyroid effects. The studies show that 2,4-D affects progesterone, which plays a role in the female menstrual cycle, and prolactin, which plays a role in lactation. 2,4-D also affects the function of the neurotransmitters and hormones dopamine and serotonin. Interference with these hormones can cause serious and lasting effects during fetal and infant development, including birth defects, neurological damage in offspring, and interference with reproductive function such as suppression of sperm production.

Male farm workers exposed to 2,4-D have lower sperm counts and more sperm abnormalities compared to men who were not exposed to this chemical. In Minnesota, Montana, North Dakota, and South Dakota, researchers have found higher rates of certain birth defects in areas with the highest use of 2,4-D and other herbicides of the same class. This increase in birth defects was most pronounced among infants who were conceived in the spring—the time of greatest herbicide use. The birth defects were most significantly elevated in males, and consisted mostly of cardiac and lung abnormalities. Deaths from birth defects were 2.7-fold higher than expected in these regions among male infants conceived in the spring. Scientific studies also suggest other harmful effects from 2,4-D, including chronic neurological toxicity and disruptions in cholesterol metabolism.



Veterinarians have reported in three published scientific studies that dogs with Canine Malignant Lymphoma are about 70 percent more likely to live in homes where 2,4-D is used to treat the yard, compared to dogs without this fatal disease. Canine Malignant Lymphoma is very similar to non-Hodgkin's lymphoma in people.

2,4-D POSES RISK FOR CHILDREN

Young children who crawl on carpets or play on the floor are most at risk for indoor exposure to 2,4-D by hand-to-mouth ingestion, skin absorption, and inhalation of household dust. Residues of 2,4-D on children's hands and in their urine have been shown to correlate closely with the levels of 2,4-D in carpet dust, demonstrating that the contamination from dust is how this chemical enters children's bodies. Nationally, the levels of 2,4-D detected in the urine of children ages 6-11 is higher than in any other age group. Children are at particular risk because their brains are still developing, and their hormone systems are vulnerable. Recent work by California toxicologists indicates that carcinogens are generally three to ten times more potent in infants and children compared to adults.

PROTECT YOURSELF FROM THE THREAT OF 2,4-D FROM THE FRONT STEPS TO THE STEPS OF WASHINGTON

- 1. Label check:** Avoid buying lawn-care products that contain 2,4-D, including "weed and feed" combinations.
- 2. Shoes off at the door, please:** Have a no-shoes policy in your home to prevent toxic chemicals such as 2,4-D tracked onto your carpets; place a rough doormat outside and encourage everyone to use it before entering your home.
- 3. Dust-bust weekly:** Vacuum carpets weekly with a vacuum cleaner that has a HEPA filter; it filters out small particles from the exhaust.
- 4. Play safe:** Check with your child's school and the local parks to make sure they don't use 2,4-D products on athletic fields, playgrounds, or lakes where people may swim. If they do, encourage them to switch to safer alternatives, or to stop using weed killers altogether.
- 5. Take action:** Send a letter to the EPA telling them to restrict 2,4-D and to the USDA telling them not allow new genetically modified crops that will increase the use of this chemical.