Glyphosate & Health Fact sheet

environmental health sciences research center

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Introduction

Glyphosate is a broad-spectrum herbicide, meaning it is toxic to a wide range of crop species. Glyphosate is used abundantly in agriculture to control the growth of broad-leaved weeds and grasses (1). Typically sold as Roundup or Ranger Pro, glyphosate is used in mixtures referred to as glyphosate-based herbicides (GBHs)(2,3). Not all Round Up contains glyphosate. To check whether a product contains glyphosate, check the product label. Glyphosate is colorless and odorless, making it imperceptible in the environment and on food, water, and dust(3). Due to the widespread use in agricultural and residential settings, exposure to glyphosate is very common. Glyphosate use increased substantially after 1996 with the innovation of glyphosate-resistant crops, which allowed the herbicide to be used throughout the growing season to manage weeds (3).

Exposure Sources

Glyphosate residues have been detected in water, soil, food, and urine(3). In settings where glyphosate is applied, exposure to the chemical is highest. Still, outside of these settings, glyphosate is very common in the environment, contributing to long-term human exposure (3). Most non-occupational exposures occur through the consumption of contaminated foods, but may also be the result of contaminated soil, dust, and water (3). The food products that most commonly have detectable glyphosate residues include cereals and processed grain-based foods(1, 5). The herbicide enters surface water through a variety of routes, including run-off (5).

Health Risks Associated with Glyphosate

Cancer Health Risks	The International Agency for Research on Cancer (IARC) classifies glyphosate as a probable human carcinogen, due to sufficient evidence of cancer risk in experimental animals (5). In animal models, exposure to glyphosate has been associated with DNA damage and implicated in a process called oxidative stress (5). This occurs when our bodies have too many free radicals, which cause damage to human cells (5). While there is limited evidence in humans as to the carcinogenicity of glyphosate, the strongest evidence was for a relationship with non-Hodgkin lymphoma (NHL) (5). The relationship with other types of cancer was not as strong.
Non-Cancer Health Risks	Glyphosate-based products can cause eye and skin irritation, and are potentially fatal when ingested (4). Because it is know that glyphosate interrupts cellular processes, more research is needed into adverse health outcomes associated with its use (5). Some studies have implicated glyphosate exposure in disease of the kidney, thyroid, and neurologic and reproductive systems; however, there is insufficient evidence to establish an association (6).

How is Glyphosate regulated?

- The EPA establishes the maximum amounts of glyphosate on food products to range from 0.1 to 400 parts per million depending on the food product (7).
- The FDA monitors food and animal feed products for compliance with the EPA-established tolerances (8).
- In 2020, the FDA detected glyphosate in 54 of 2,800 human food samples (8).
- Glyphosate is not a restricted use pesticide, so no application certification or training is required for its use (4).

What can you do?

- Limit personal use of glyphosate.
- Follow all safety precautions indicated on the product label (4).
- Wear personal protective equipment including long sleeves and pants, close-toed shoes, eye protection, and chemical resistant gloves when applying glyphosate-based herbicides (4).
- Allow 12 hours after application of glyphosate before re-entering the area or field (4).

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