



ROUNDUP FACT SHEET

WHAT IS ROUNDUP?

Roundup®, a glyphosate-based herbicide weed killer, is wildly popular for effectively killing weeds while allowing genetically modified crops to flourish.

Manufactured by Monsanto, an agricultural biotechnology corporation that was acquired by Bayer AG in 2018, Roundup is used in almost all corn, cotton and soy farming (as well as many other agricultural concerns) in the United States, covering more than 168 million acres, and on individual consumers' personal lawns and gardens.

WHO MANUFACTURES ROUNDUP?

Roundup is a product of Monsanto, an agricultural biotechnology corporation founded in 1901 and acquired by Bayer in 2018. The company was one of the first to genetically modify plants, conducting field trials of genetically modified crops as early as the late 1980s. By 2015, Monsanto was the world's number one supplier of seeds, and controlled over one-quarter of the entire global seed market.

WHAT IS GLYPHOSATE?

Glyphosate, the main ingredient used in Roundup, is an organophosphorus (OP) compound that is an extremely effective herbicide.

DOES GLYPHOSATE CAUSE CANCER?

According to a 2015 risk assessment by the World Health Organization's International Agency for Research on Cancer (IARC), there is evidence that glyphosate may cause cancer in animals. Additionally, the IARC found that some studies indicate glyphosate may trigger chromosomal damage and cancer-causing mutations in human cells. However, Monsanto, as well as the U.S. Environmental Protection Agency, maintain that Roundup is safe if used as directed.

WHAT DOES THE EPA SAY ABOUT GLYPHOSATE?

The EPA has repeatedly stated that glyphosate is unlikely to cause cancer in humans.

WHICH GLYPHOSATE ASSESSMENT IS MORE RELIABLE: EPA OR IARC?

A significant amount of reputable research may contradict the EPA's assessment. Additionally, EPA executives' alleged willingness to work closely with Monsanto may suggest agency capture – where regulators may be more concerned with private interests than public health.

One Environmental Sciences Europe analysis published in January 2019 claimed that the EPA overlooked peer-reviewed independent studies in its report, opting instead to rely on research funded by Monsanto to support the company's claim that glyphosate does not cause cancer.

CANCER STUDIES OVERVIEW

In two reports released in December 2017 and April 2019, the Environmental Protection Agency stated that there are no public health risks associated with glyphosate use. However, there have been multiple contradicting studies that indicate glyphosate may be carcinogenic:

March 1985: An initial peer review of glyphosate completed by members of the EPA's toxicology branch classifies glyphosate as a possible human carcinogen.

January 2005: Research published in *Environmental Health Perspectives*, which analyzed data from over 54,000 pesticide workers in a U.S. Agricultural Health Study, discovers that pesticide workers that use Roundup on farms in North Carolina and Iowa have twice the risk of developing multiple myeloma than those who do not use Roundup.

2008: An *International Journal of Cancer* study finds that 10+ days of Roundup exposure per year doubles a person's risk of developing NHL.

March 2015: The International Agency for Research on Cancer (IARC) classifies glyphosate as a group 2A possible carcinogen.

August 2018: The Environmental Working Group discovers that 75 percent of 45 oat-derived products contain levels of glyphosate above what is classified as safe for children's consumption.

January 2019: An analysis published in *Environmental Sciences Europe* finds that the EPA ignored peer-reviewed independent studies, instead relying heavily on research paid for by Monsanto to support their conclusions.

February 2019: Former EPA advisors publish research that claims heavy exposure to Roundup increases a person's risk of developing non-Hodgkin's lymphoma by 41 percent.

April 6, 2019: The ATSDR releases a toxicological profile that supports the assessment completed by the IARC in 2015, which associates glyphosate with cancer.

NON-HODGKIN'S LYMPHOMA

Non-Hodgkin's lymphoma (NHL) is an umbrella term for multiple types of lymphoma that share commonalities with one another. In general, lymphoma is cancer that starts in white blood cells called lymphocytes, which work with other immune cells to fight foreign substances. Lymphoma originates in the lymph nodes, spleen, bone marrow, thymus, adenoids, or tonsils, but can spread to vital organs like the brain and liver.

If lymphocytes mutate and become cancerous, their ability to control cell growth and division is disabled. Usually, lymphocytes go through a predictable life cycle: as old lymphocytes die, new ones are created to replace them. In cells infected by NHL, however, the lymphocytes do not die. Instead, they continue to divide, oversupplying the lymph nodes with lymphocytes and causing swelling.

There are two main types of lymphocytes, both of which originate from stem cells in bone marrow. B lymphocytes, or B cells, remain in the bone marrow and make antibodies. T lymphocytes, or T cells, travel to the thymus and help the body kill cancerous and viral cells. Treatment options for NHL include chemotherapy, stem-cell transplants, radiation, and medications, and are largely dependent on which type of cell the NHL arises in.

Each year, about 75,000 Americans are diagnosed with NHL. According to the American Cancer Society, NHL has an overall five-year survival rate of 71 percent, though this varies widely depending on the presence of risk factors.

MULTIPLE MYELOMA

Multiple myeloma, or plasma-cell myeloma, is a type of immune system cancer that originates in plasma cells. Plasma cells are short-lived cells that derive from B cells fighting an infection. When plasma cells become

WHAT OTHER PRODUCTS CONTAIN GLYPHOSATE?

MONSANTO PRODUCTS

- Aquamaster
- Bronco
- Campaign
- Expedite
- Fallow Master
- Honcho
- Landmaster
- Pondmaster
- Protocol
- Ranger
- Roundup
- RT 3

DOW AGROSCIENCES PRODUCTS

- Accord
- Durango
- Duramax
- Glyphomax
- Glypro
- Rodeo

DUPONT PRODUCTS

- Abundit Extra

CENEX / LAND O'LAKES PRODUCTS:

- Silhouette

HELENA PRODUCTS

- Rattler
- Hoss Ultra
- Showdown

LOVELAND PRODUCTS

- Mirage
- KleenUp
- Makaze
- Mad Dog

RIVERSIDE/TERRA PRODUCTS

- Jury

SYNGENTA PRODUCTS

- Touchdown

OTHER PRODUCTS

- <https://www.collective-evolution.com/2018/08/26/list-of-products-brands-that-tested-positive-for-monsantos-glyphosate/>

cancerous, the overgrowth pushes out normal blood-forming cells from bone marrow, lowering the blood count. This can lead to anemia, which comes with symptoms including weakness and chronic fatigue, or low blood platelet levels, which comes with symptoms including an increase in bruising and bleeding.

Myeloma also damages cells that keep people's bones strong. Myeloma-infected cells create a substance that makes bones dissolve quicker. If the body cannot replace this bone at the same rate it is dissolving, bones become weak and extremely prone to fractures and breakages. Myeloma cells are also incapable of protecting the body from infections the same way normal plasma cells do. When normal plasma cells are crowded out, there are not enough antibodies left to fight off infections.

In 2019, there will be an estimated 32,000 new cases of myeloma and almost 13,000 deaths in the United States. Multiple myeloma has a 52.2 percent five-year survival rate.

HOW MUCH GLYPHOSATE IS IN ROUNDUP?

The amount of glyphosate depends on which Roundup product is being used:

- Roundup Ready III contains 2 percent glyphosate
- Roundup Lawn and Garden contains 18 percent glyphosate
- Roundup Original contains 41 percent glyphosate
- Roundup Super Concentrate contains 50.2 percent glyphosate

Higher concentrations are used on harder-to-kill items in large areas of grasses and weeds. Many Roundup products, including Roundup Ready III, Roundup Lawn and Garden, and Roundup Original, also contain other ingredients that help glyphosate work faster and more effectively.

ARE GLYPHOSATE AND ROUNDUP THE SAME THING?

Not quite. Glyphosate is the active ingredient in Roundup products, but only makes up around 41 percent of its concentrate form and various percentages in other Roundup products (see above). The remainder of the formula includes inactive ingredients and adjuvants. Adjuvants are chemicals that are used to enhance the performance of the active ingredient – in this case, glyphosate. The main adjuvant found in Roundup is the surfactant polyethoxylated tallowamine, which helps glyphosate penetrate plant cells.

IS ROUNDUP MORE TOXIC THAN GLYPHOSATE?

Possibly. The adjuvants, or inactive chemicals that help glyphosate penetrate and kill plant cells, may be hazardous to humans. Researchers have found that the combination of glyphosate with these chemicals may multiply the toxicity of the product. In other words, the ingredients may be even more powerful (and potentially dangerous) when combined into a single product than standing alone.

WHAT ARE THE SIDE EFFECTS OF ROUNDUP EXPOSURE?

Brief exposure to glyphosate can cause the following symptoms:

- Eye or skin irritation
- Irritation in the nose and throat (if inhaled)

- Saliva, burns in mouth and throat, nausea, vomiting, and diarrhea (if swallowed). If a significant amount is swallowed (usually intentionally), it can be fatal.

WHO MAY FACE THE HIGHEST RISK OF DEVELOPING CANCER DUE TO ROUNDUP EXPOSURE?

Individuals who may be at the highest risk of developing NHL from glyphosate exposure are those who use it most frequently, typically as a part of their job. The frequent and long-term high-level exposure experienced by agricultural workers, groundskeepers, landscapers, gardeners, farmers and pesticide/ herbicide applicators may put them most at risk.

HOW DO I KNOW IF ROUNDUP MAY HAVE CAUSED MY CANCER?

If you were diagnosed with non-Hodgkin's lymphoma after prolonged Roundup exposure, it is possible that this exposure may have caused or significantly contributed to the development of your cancer.

Research published in the International Journal of Cancer in 2008 found that individuals exposed to Roundup for 10 or more days in a year may have twice the risk of developing NHL than other individuals. Even more recently, in February 2019, former EPA advisors published research claiming heavy exposure to Roundup may increase a person's risk of developing non-Hodgkin's lymphoma by 41 percent.

WHAT DO ROUNDUP LAWSUITS ALLEGE?

Roundup lawsuits claim that Roundup is not as safe as Monsanto claims and that the company should be held accountable for failing to warn the public about the cancer risk allegedly associated with prolonged Roundup usage.

WHO CAN FILE A ROUNDUP LAWSUIT AGAINST MONSANTO?

While anyone can file a lawsuit if they have evidence supporting their claims, the strongest Roundup cases involve individuals diagnosed with non-Hodgkin lymphoma (NHL) or multiple myeloma after prolonged and significant exposure to Roundup.

Common plaintiffs include, but are not limited to:

- Agricultural workers
- Farmers
- Gardeners
- Government workers
- Groundskeepers
- Individuals who use Roundup on their personal or business properties
- Landscapers
- Lawn care workers
- Pesticide and herbicide applicators
- Nursery employees
- Maintenance workers
- Greenskeepers

HAVE THERE BEEN ANY MONSANTO SETTLEMENTS OR VERDICTS?

Yes. To-date, there have been three cases heard with plaintiffs prevailing in all three. Damages awarded the victims include \$289 million, \$80 million, and \$2 billion, respectively.

DEWAYNE JOHNSON V. MONSANTO COMPANY

In August 2018, a California federal jury unanimously ordered Monsanto to pay \$289 million to Dewayne "Lee" Johnson, who developed NHL after regularly using Roundup as part of his job as a school groundskeeper. The jury found that Monsanto failed to warn of the carcinogenic dangers associated with Roundup. On Oct. 22, a federal judge slashed his winnings to \$78 million - \$39 million in compensatory and \$39 million in punitive damages. Now, Monsanto has filed an appeal trying to reverse the verdict, claiming that the verdict is legally flawed, there were judicial errors, and the plaintiff failed to prove general causation.

EDWIN HARDEMAN V. MONSANTO COMPANY

In March 2019, a jury for the second federal Roundup case ordered Monsanto to pay \$80 million to 70-year-old Edwin Hardeman. Hardeman was diagnosed with NHL in 2015 after using Roundup on his 56-acre property for 26 years. The jury concluded that Roundup was a substantial factor in his cancer diagnosis and said that Monsanto should be held liable for failing to include a warning label on its product. The company plans on appealing the verdict.

PILLIOD V. MONSANTO COMPANY

On May 9, 2019, jury deliberations began for the third federal Roundup trial against Monsanto. The plaintiffs are a married couple in their 70s, Alva and Alberta Filliod. Both were diagnosed with NHL after using Roundup from the mid-1970s until a few years ago on multiple properties they own. On May 13, 2019, the California jury ordered Monsanto to pay more than \$2 billion in damages. Bayer is expected to appeal.

IS THERE A FEE FOR HAVING AN ATTORNEY REVIEW MY CASE?

All evaluations are free. There are no costs or fees unless we decide to take on your case and we prevail. If we do not recover for you, you owe us nothing.

AREN'T MOST PRODUCT LIABILITY LAWSUITS JUST CLASS ACTIONS WHERE THE PLAINTIFF CAN EXPECT ONLY A SMALL, SYMBOLIC SETTLEMENT?

Not necessarily. As of now, there have been three individual (not class action) Roundup cases won by plaintiffs with non-Hodgkin's lymphoma. Each of these victims received significant awards - from tens of millions to two billion dollars. A number of factors, including proof of liability, medical expenses, lost work, other financial damages, emotional pain and suffering, the application of punitive damages, and the defendant's assets are key factors in determining the outcome of a lawsuit.

WE'RE NOT THE TYPE OF PEOPLE WHO SUE; DO WE REALLY NEED TO FILE A LAWSUIT?

If you or a loved one have been diagnosed with NHL or multiple myeloma after Roundup exposure, you may lose enormous sums of money due to lost work, medical expenses and future preventative care. Filing a successful lawsuit can help mitigate some of these costs, which, if caused by Roundup exposure, should not be yours to bear. A lawsuit also provides you with a vehicle to hold Monsanto accountable for the emotional pain and suffering the company allegedly caused you and your family. To be sure, there is no shame in exercising your Seventh Amendment constitutional right to a jury trial, as guaranteed and enshrined in the Bill of Rights.

HOW MUCH TIME DO I HAVE TO FILE A ROUNDUP LAWSUIT?

The statute of limitations for filing a product liability claim varies on a state-by-state basis. Contacting a lawyer about your case can help you determine whether you are eligible to file a Roundup lawsuit. That said, every day that passes is one day closer to the statutory deadline. The best practice is not to delay.