

CITY OF CORAL GABLES

--MEMORANDUM--



The City Beautiful

TO: Commissioner Jorge L. Fors, Jr.

FROM: Chelsea Granell, Commission Liaison

DATE: May 10, 2019

SUBJECT: Research on Weed Killers Containing Glyphosate

What is Round Up?

Roundup is the brand name of a systemic, glyphosate-based herbicide originally produced by Monsanto, which Bayer acquired in 2018. Its main active ingredient is glyphosate. Glyphosate is the most widely used herbicide in the United States.

What is Glyphosate?

Glyphosate is an herbicide that is applied to the leaves of plants to kill both broadleaf plants and grasses or weeds. The sodium salt form of glyphosate is used to regulate plant growth and ripen specific crops. Generally, it is used in agriculture and forestry, on lawns and gardens, and for weeds in industrial areas. Glyphosate is rarely used on its own in the field. Herbicide formulations as a whole include a variety of other chemicals, such as surfactants to help glyphosate enter plant cells, and other additives that extend the product's shelf life.

Glyphosate was first registered for use in the U.S. in 1974 and it is one of the most widely used herbicides in the United States. Some products containing glyphosate control aquatic plants.

How does Glyphosate work?

Glyphosate is a non-selective herbicide, meaning it will kill most plants. It prevents plants from making certain proteins that are needed for plant growth. Glyphosate stops a specific enzyme pathway known as the shikimic pathway. The shikimic acid pathway is necessary for plants and some microorganisms.

The Negative Effects of Products Containing Glyphosate:

There is heavy debate on whether or not glyphosate poses health risks to humans. More specifically, it is unclear if Roundup directly causes cancer due to limited scientific evidence. In the recent California court cases (cited below), plaintiffs alleged to have developed Non-Hodgkin Lymphoma (NHL) because of exposure to Roundup. In addition, a study conducted by the University of Washington states that glyphosate has potential links to NHL.

Whether or not it causes cancer, there may be other long-term risks associated with glyphosate. When glyphosate is sprayed, birds, invertebrates (e.g. insects) and microorganisms may also be exposed to glyphosate-containing herbicides. It can be harmful to insects (including bees) flying through from eating treated crops, or by eating prey that has been feeding on treated crops. The spray can also be blown by the wind into field margins, or into wild habitats. If it is applied near areas that have been washed by the rain into groundwater, streams, rivers and coastal waters, then it can potentially affect food resources and cause changes to the ecosystem.

Research and Statements

Regulatory uncertainty and debate are extensive. Regulatory debate about the safety of glyphosate may be summarized as follows:

- In March 2015, the World Health Organization's International Agency for Research on Cancer (IARC) conducted an extensive review of the published peer-reviewed epidemiologic, toxicologic and genetic literature on glyphosate, independent of influence by the pesticide manufacturing industry, and concluded that glyphosate is "probably carcinogenic to man."
- In November 2015, the European Food Safety Authority (EFSA) deemed glyphosate "unlikely to pose a cancer risk for man." That conclusion was based on a glyphosate renewal assessment report (RAR) presented in January 2014 by the Federal German Institute for Risk Assessment. It is important to note that the EFSA and RAR review groups included scientists that did not disclose their names and financial interests and also relied on unpublished, non-peer-reviewed reports generated by industry.
- In March 2017, following a heated argument over the safety of glyphosate, and numerous deferments of the European ballot, the European Union (EU) appointed the European Chemicals Agency (ECHA) to look into the issue of glyphosate toxicity. The ECHA's Risk Assessment Committee analyzed a large amount of scientific data and concluded that "the scientific evidence so far available does not satisfy the criteria for classifying glyphosate as carcinogenic, mutagenic or toxic for reproduction." According to the ECHA, glyphosate may cause grave damage to the eyes and be toxic to aquatic organisms with long-term effects.
- On November 27, 2017, the European Commission extended the authorization for glyphosate for another 5 years. The European Parliament, however, opposed this decision and issued a call for pesticide approvals to be based on published peer-reviewed studies by independent scientists instead of the current system, which is largely based on unpublished proprietary studies.

- On May 6, 2019, the U.S Environmental Protection Agency (EPA) announced the release of its [Proposed Interim Registration Review Decision](#) and continues to find no human health risks associated with the use of glyphosate and the herbicide is not a carcinogen, the agency said in its latest review. However, the agency did acknowledge glyphosate poses some ecological risks.
- In a news release the EPA stated that, “While the agency did not identify public health risks in the 2017 human health risk assessment, the 2017 ecological assessment did identify ecological risks.” They referenced potential risk to mammals and birds within the application area or areas near the application area. To address these risks, the EPA is proposing management measures to help farmers target pesticide sprays on the intended pest, protect pollinators, and reduce the problem of weeds becoming resistant to glyphosate.”

Latest Court Cases

State of California Federal Case – The case of Edwin Hardeman v. Monsanto, began Feb. 25, 2019. The judge approved a motion by Monsanto to bifurcate the trial, limiting evidence jurors heard during a first phase to causation only. On March 19, a unanimous jury decision handed a first-round victory to Hardeman, as the six-jury members found that Hardeman’s exposure to Roundup was a “substantial factor” in causing his Non-Hodgkin lymphoma. On March 27, the jury returned a verdict of approximately \$80 million, including punitive damages of \$75 million.

State of California State Case – DeWayne “Lee” Johnson v. Monsanto concluded on Aug. 10, 2018 with a jury ruling that Monsanto’s weed killer was a substantial contributing factor in causing Mr. Johnson’s cancer, and ordered Monsanto to pay \$289.25 million in damages, including \$250 million in punitive damages. The judge reduced the punitive damages to \$39 million in an order dated Oct. 22, 2018, which put the total verdict at approximately \$78 million. Monsanto declared it would appeal and Johnson has cross-appealed, seeking to reinstate the jury award. The appeal is filed in the California State Court of Appeals, case number A155940.

Recent Scientific Studies and Data

A recent study conducted by the [University of Washington](#), concluded that “the rise of glyphosate as the most widely used herbicide raises serious health concerns, given its potential links with Non-Hodgkin Lymphoma (NHL).”

Some evidence suggests that when glyphosate is combined with other ingredients, it has different effects on microorganisms. Research conducted by the University of Calgary suggests that glyphosate containing products may have other toxic effects besides cancer.

The Difference Between Glyphosate and Roundup

Glyphosate is rarely used on its own in the field. Herbicide formulations as a whole include a variety of other chemicals, such as surfactants to help glyphosate enter plant cells, and other additives that extend the product's shelf life. In the U.S. and E.U., companies are required to print on the packaging how much of the active ingredient the product contains. This typically is not the case for other ingredients, which are considered "inert" because they do not contribute to the herbicidal activity of the formulation. When glyphosate is combined with other ingredients, research suggests that it can change its effects on organisms and mitochondrial cells.

Local Cities that have Banned Glyphosate

Miami – Announced a City-wide ban on glyphosate-based herbicides in February 2019.

Miami Beach – Passed a resolution banning the use of glyphosate weed killers for landscaping and maintenance work on City-owned property.

North Miami – City Council approved a plan calling for the gradual reduction of pesticide use on City property and a study on alternative pesticides.

Stuart, Florida – City Commission voted to ban glyphosate calling for an integrated pest control plan that reduces the use of glyphosate with the ultimate goal of eliminating chemicals.

South Miami – City Council restricted usage of glyphosate in areas near waterways.

Places that Have Banned or Restricted Use of Glyphosate

Conclusion

There are limited scientific studies or sufficient evidence that links Glyphosate, the active ingredient in Roundup, that suggests it causes cancer or has other potential health risks. However, it is important to note that there is even more limited research on the effects of glyphosate when combined with other ingredients. The most recent study such as the one conducted by the University of Washington states that glyphosate has potential links to Non-Hodgkin Lymphoma and can cause mutations to cells. There are a number of European studies that make similar claims to having potential harmful risks to not just humans but invertebrates, birds and mammals. A multitude of countries and cities across the world have taken a stance on either banning or restricting usage of products containing glyphosate. It is also important to note that direct and indirect impacts may be caused by glyphosate by the other ingredients in glyphosate-containing herbicides, or by the combined action of the different chemicals. Therefore, glyphosate's negative effects are not limited solely to human exposure. It can have ecological impacts, especially to nearby waterways if it makes contact with aquatic vegetation and animals. Most importantly, it is critical to note that Roundup and other glyphosate containing products have other ingredients that may be toxic and companies are only required to list their active ingredients, not all others. This poses a huge challenge to scientists investigating the

physiological activities of pesticides. Herbicide-producing giants including Bayer, Roundup's developer, or Syngenta, which produces the glyphosate-containing herbicide Touchdown, aren't required to make their full ingredients lists public therefore, there is limited research on the effects glyphosate containing products has on organisms when combined with other ingredients.

Links of Articles, Reserach and Useful Information:

U.S Environmental Protection Agency (EPA) Proposed Interim Registration Review Decision

[Proposed Interim Registration Review Decision](#)

<https://www.washington.edu/news/2019/02/13/uw-study-exposure-to-chemical-in-roundup-increases-risk-for-cancer/>

<https://www.cnn.com/2019/02/14/health/us-glyphosate-cancer-study-scli-intl/index.html>

https://www.momsacrossamerica.com/10_alternatives_to_roundup

<https://www.nytimes.com/2019/03/19/business/monsanto-roundup-cancer.html>

<https://www.pbs.org/newshour/health/what-you-need-to-know-about-a-popular-weed-killers-alleged-link-to-cancer>

<https://www.sciencedirect.com/science/article/pii/S1383574218300887>

[National Law Review Article](#)

[Bayers Point of View on Glyphosate](#)