

Glyphosate Causes Cancer

Is Monsanto Ready for the Consumer Response?

The International Agency for Research on Cancer (IARC) determined in March that the herbicide glyphosate, or Roundup (produced by Monsanto), is a potential cancer causing agent for humans, based on laboratory animal studies.¹ The finding adds to the literature of adverse affects linked to glyphosate and has triggered a new round of calls to ban its use. Beyond Pesticides is calling for an end to glyphosate use and urging EPA to suspend its uses, while telling consumers to take steps to protect themselves and the environment from exposure to this harmful chemical. As the most widely used herbicide in the world, individuals are regularly exposed to glyphosate through contaminated food and its use on lawns and landscapes.



Home and Garden Applications

The frequency of glyphosate use in non-agricultural settings is second only to the herbicide 2,4-D.⁸ EPA estimates between 5-8 million pounds of glyphosate is sprayed each year for residential lawn and garden use, and 13-15 million pounds is applied by professional applicators on industrial, commercial, and government properties.⁹ Glyphosate-containing herbicides not only put those applying the product at risk, but may also endanger those nearby as a result of pesticide drift.¹⁰ Further, glyphosate-based herbicides bind to soil and remain on lawns an average of 47 days, though studies indicate the chemical may persist

for nearly six months in certain soils,¹¹ long after the small yellow flags telling children and pets to stay off are removed. USGS found that glyphosate is widespread in the environment, and in particular it is commonly detected in surface waters.

Glyphosate in Agriculture

According to the U.S. Geological Survey (USGS), an estimated 283 million pounds of glyphosate was sprayed across the country for agricultural use in 2012.² Applications to corn and soybeans, a majority of which are genetically engineered to tolerate applications of glyphosate, accounted for over 70% of glyphosate's use.³ Studies show that glyphosate can metabolize in crops sprayed with the chemical,⁴ and persist in high levels in food products manufactured with glyphosate-contaminated crops.⁵

A 2014 Government Accountability Office report found that neither the U.S. Department of Agriculture (USDA) nor the Food and Drug Administration (FDA) regularly test for residues of glyphosate in the food supply.⁶ However, shortly after IARC's determination, the U.S. Environmental Protection Agency (EPA) indicated to *Reuters* that, "Given increased public interest in glyphosate, EPA may recommend sampling for glyphosate in the future."⁷

Current Regulations

EPA is in the process of conducting a review of glyphosate on a 15-year cycle, and is set to release its preliminary risk assessment in 2015. Although the agency has already indicated that it will require measures to mitigate the rising tide of resistant weeds in agriculture,¹² such a management plan would have very little impact on the health of farmworkers and the environment, and continue to present a risk to consumers through residues on food and in home and garden use.

EPA conducts its chemical reviews in close cooperation with Canada's Pest Management Regulatory Agency, which recently released its reevaluation decision on glyphosate for public comment. The agency stopped far short of meaningful action on the chemical, choosing instead to address risk through changes in the pesticide label, such as additional precautionary statements and recommended spray buffer zones.



“Probable” carcinogen: what does that mean for my health?

It’s easy for consumers to say, and no doubt many activists have heard, the refrain that “everything causes cancer.” Often this statement is used as a reason to brush-off needed action on industrial contaminants –after all, we’re exposed to hundreds of environmental chemicals each day, so why worry about a “probable” carcinogen, the ranking IARC has given to glyphosate?

Rather than throw our collective hands up, the prospect of recurring chemical exposure should rally us to address these health concerns and seek out alternatives when credible and respected scientific agencies make such determinations. A look into IARC’s evaluation process showcases the gravity of these classifications. IARC employs a “strength of evidence” assessment, basing the carcinogenicity of a chemical on whether it is capable of increasing the occurrence of malignant growths,¹³ reducing their latency (time between exposure and the onset of cancer), or increasing the severity or multiplicity of such growths. Prior to classifying a chemical, 17 experts from 11 countries analyzed scientific studies and data for approximately one year before meeting together in a Working Group in an attempt to reach a consensus evaluation. Consideration is given to exposure data, studies of cancer in humans, studies of cancer in experimental animals, and mechanistic and other relevant data.

[Note: cancer ratings are based on studies of laboratory animals, since we do not test chemicals on humans. In some cases there is epidemiologic evidence, often from workplace data that links chemical exposure to a cancer effect. However, since the point of testing is to inform regulatory decisions to prevent exposure to carcinogens, glyphosate’s cancer ranking as the highest possible rating for carcinogenicity in humans based on laboratory data is extremely meaningful.]

Chemicals are placed into one of four categories:

- **Group 1: Is Carcinogenic to Humans**
Sufficient evidence of carcinogenicity in both humans and experimental animals,
- **Group 2:**
 - (A) **Probably Carcinogenic to Humans**
Limited evidence of carcinogenicity in humans; Sufficient evidence of carcinogenicity in experimental animals
 - (B) **Possibly Carcinogenic to Humans**
Limited evidence of carcinogenicity in humans; Less than sufficient evidence of carcinogenicity in experimental animals
- **Group 3: Not Classifiable as to its Carcinogenicity in Humans**
Inadequate evidence of carcinogenicity in humans; limited evidence of carcinogenicity in experimental animals
- **Group 4: Probably not Carcinogenic to Humans**
Evidence suggests lack of carcinogenicity in humans and experimental animals¹⁴

Glyphosate falls in IARC’s group 2A classification

Human data available to IARC was based on research conducted since 2001. “Case-control studies of occupational exposure in the USA, Canada, and Sweden reported increased risks for non-Hodgkin lymphoma that persisted after adjustment for other pesticides,” according to IARC’s article in *The Lancet Oncology*. In its monograph, the agency notes that EPA previously classified glyphosate as a possible carcinogen in humans based on studies that show tumors in mice, yet in 1991, the agency changed its classification to evidence of non-carcinogenicity in humans after a re-evaluation of the study. IARC used both EPA’s report and more recent data in its conclusion that there was sufficient evidence of the carcinogenicity of glyphosate in experimental animals.

“There were several studies. There was sufficient evidence in animals, limited evidence in humans and strong supporting evidence showing DNA mutations ... and damaged chromosomes,” said Aaron Blair, Ph.D., chair of the IARC Working Group and a scientist emeritus at the National Cancer Institute, in an interview with *Reuters*.¹⁵

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**International Agency
Research on Cancer**



Take Action!

Consumers should not have to wait for federal regulators to act in order to address glyphosate use and contaminated foods in their community. Take the following five steps, all of which can be started immediately, to reduce glyphosate use for you, your family, and our communities at-large.

Tamp Down on Roundup

1) Buy organic foods.

Because organic standards, with few exceptions, do not allow the use of any toxic synthetic pesticides in food production, buying organic is the only surefire way to prevent glyphosate in your diet. Choosing organic also means buying into an agricultural system that protects farmworkers, prevents water contamination, and safeguards wildlife.

2) Stop the use of lawn care products like Roundup, which contain glyphosate.

You don't need to be an organic farmer or master gardener to manage your lawn without the use of pesticides and herbicides like Roundup. Alternative practices are available to help create conditions where weeds do not become a significant problem, and new least-toxic herbicides are available to help with your transition to organic, or in those increasingly rare instances when weeds do get out of control. See Beyond Pesticides' Lawns and Landscapes resources for assistance: www.beyondpesticides.org/lawn.

3) Voice your concerns about glyphosate to your local grocery and home improvement store, and encourage them not to sell products containing or sprayed with glyphosate.

Forward-looking home improvement stores are already starting to ditch lawn care pesticides like Roundup in favor of least-toxic alternatives. Tell your local hardware stores to stop selling glyphosate-based herbicides (and that aisle filled with pesticides, while you're at it!).

Your grocery store should also hear about your concerns with glyphosate-sprayed crops. Let them know that food laced with a probable carcinogen is not acceptable for you or your family's health.

While both these retailers might say they can't control the sourcing of their products, make sure your message gets to managers, who will report back to owners or corporate headquarters.



March Against Monsanto protest outside of White House in May 2015. Monsanto is the leading producer of glyphosate. Photo Courtesy Ford Fischer/News2Share www.news2share.com

4) Join with other concerned residents in your community and work toward a resolution prohibiting toxic lawn care herbicides from being used in your town.

Starting a movement isn't easy, but it is amazing how quickly you can pick up steam with the right information to the right local leaders, and a group of committed individuals. See Beyond Pesticides' fact sheet on how to *Start Your Own Local Movement* [<http://beyondpesticides.org/documents/MovementFactsheet.pdf>] for the basics you'll need to begin your campaign to stop the use of glyphosate in your community.

5) Write letters and sign petitions to EPA, USDA, and other elected officials.

Although signing a petition against glyphosate [<http://bit.ly/StopGlyphosatePetition>] like the one Beyond Pesticides has created is a simple step, after you take action we encourage you to craft your own unique letter to your local, state, and federal representatives, as well as officials at EPA and USDA. Let them know that you're not okay with a carcinogen on our lawns and in our food.

For help completing these actions, please don't hesitate to contact Beyond Pesticides at info@beyondpesticides.org or by calling 202-543-5450.

A World Without Glyphosate

As we consider the end of the herbicide glyphosate (Roundup), the question that comes to mind is what will replace it. Of course, there are replacement products that are available for people and communities considering the shift away from toxic pesticide products. But, the long-term solution requires the adoption of organic systems that focus first on practices and prevention and, only second and as a last resort, on alternative products. Predictably, and regardless of the International Agency for Research on Cancer's classification for glyphosate, this question of alternatives to the weed killer has been emerging because of widespread weed resistance to glyphosate.

Background

The widespread use and reliance on glyphosate, and the simultaneous reductions in the use of sustainable weed management practices, has resulted in glyphosate-resistant weeds. In regions of the U.S. where Roundup-Ready (glyphosate-tolerant) crops dominate, there are now evolved glyphosate-resistant populations of economically-damaging weed species. Growers of GE cotton in 2014 asked for an emergency use of the herbicide propazine due to weed resistance across three million acres. The request was denied by EPA because public exposure to triazine herbicides (propazine's chemical cousin with atrazine and others) in the aggregate already showed unacceptable risk levels. Pursuing sustainable alternatives can prevent the pesticide treadmill that results from the use of GE crops and pesticides like glyphosate. Ecological pest management strategies, organic practices, and solutions that are not chemical-intensive are the most appropriate and long-term solution to managing unwanted plants or weeds.

Common Glyphosate Uses

An organic, feed-the-soil approach to the growing of plants, including turf, is the most sustainable and cost-effective. With this systems approach in organic lawns, landscapes, and agriculture, we enhance soil health, beneficial bacteria and fungi in the soil, natural nutrient cycling, crop rotation, and incorporate organic compatible management practices and products.

Agriculture

The Roundup-Ready crops (soy, corn, canola, alfalfa, cotton, sorghum) can all be grown organically and, in fact, are a part of the \$40 billion organic industry that continues to grow. Shifting to newer herbicide-tolerant varieties, such as those that are now tolerant of the herbicide 2,4-D (Enlist Duo), only postpones resistance while exposing people and the environment to another cancer causing agent that is also an endocrine disruptor.

Lawns and Landscapes

The principles of organic are available for all of glyphosate uses: fence lines, utility poles, sidewalks, driveways, garden beds, roadsides and medians, rights-of-way, and parks. For all these current uses, there are either opportunities for mechanical removal (goats, flame and steam weeding, hand pulling), mulching systems and cultural practices (landscape fabric, high mowing, hedgerows, or organic compatible products (horticultural vinegar, herbicidal soaps, essential oils, corn gluten meal).

Please see Beyond Pesticides' page www.beyondpesticides.org/lawn for more information on alternatives to glyphosate.

Monsanto and the Industry Response

In response to the IARC cancer finding on glyphosate, Monsanto has objected strenuously. Monsanto's official position: "The 2A classification does not establish a link between glyphosate and an increase in cancer. "Probable" does not mean that glyphosate causes cancer and IARC's conclusion conflicts with the overwhelming consensus by regulatory bodies and science organizations around the world, like the U.S. EPA, which concluded that there is evidence of non-carcinogenicity." There no doubt will be industry supported efforts to undercut the finding of this respected scientific body of the World Health Organization. An assessment by the German Federal Institute for Risk Assessments (BfR), which takes the non-carcinogen position, is based almost solely on industry science and classified industry reports provided to it by the Glyphosate Task Force, an industry consortium led by Monsanto. Three scientists on Germany's scientific panel on pesticides work for the pesticide industry. BfR and IARC's findings have been released during a pivotal time, as a decision on whether to extend the license for glyphosate's use in Europe is currently pending, and these studies are sure to be incorporated into the decision making process. Meanwhile, glyphosate is being taken off the shelves by companies across Europe and member states are calling for the European Union to ban the chemical.

Endnotes

1. International Agency for Research on Cancer. 2015. *IARC Monographs Volume 112: evaluation of five organophosphate insecticides and herbicides*. <http://www.iarc.fr/en/media-centre/iarcnews/pdf/MonographVolume112.pdf>
2. United States Geologic Survey. 2015. *Pesticide Use Maps. Estimated Agricultural Use for Glyphosate, 2012*. http://water.usgs.gov/nawqa/pnsp/usage/maps/show_map.php?year=2011&map=GLYPHOSATE&hilo=H&disp=Glyphosate
3. *Ibid*
4. Arregui, Maria et al. 2003. Monitoring glyphosate residues in transgenic glyphosate-resistant soybean. *Pest Management Science*. 60:163–166. DOI: 10.1002/ps.775
5. Rubio, Fernando et al. 2014. Survey of Glyphosate Residues in Honey, Corn and Soy Products. *Journal of Environmental and Analytical Toxicology*. 5:249. doi: 10.4172/2161-0525.1000249
6. Government Accountability Office. 2014. FDA and USDA Should Strengthen Pesticide Residue Monitoring Programs and Further Disclose Monitoring Limitations. GAO-15-38 <http://www.gao.gov/products/GAO-15-38>
7. *Reuters*. 2015. U.S regulators may recommend testing food for glyphosate residues. <http://uk.reuters.com/article/2015/04/17/us-food-agriculture-glyphosate-idUKKBN0N82K020150417>
8. Environmental Protection Agency. 2013. 2006-2007 Pesticide Market Estimates. Usage (Page 3). http://www.epa.gov/opp00001/pestsales/07pestsales/usage2007_3.htm#3_7
9. *Ibid*.
10. Environmental Protection Agency. 2014. Introduction to Pesticide Drift. <http://www2.epa.gov/reducing-pesticide-drift/introduction-pesticide-drift>
11. Beyond Pesticides. 2014. *ChemicalWatch Factsheet*. Glyphosate. <http://www.beyondpesticides.org/pesticides/factsheets/Glyphosate.pdf>
12. Gillam, Carey. 2015. EPA regulator says set to release key herbicide report, lauds biopesticides. *Reuters*. <http://www.reuters.com/article/2015/05/05/us-food-agriculture-glyphosate-idUSKBN0NQ2AL20150505>
13. International Agency for the Research on Cancer. 2006. **Preamble to the IARC Monographs** (Amended January 2006). <http://monographs.iarc.fr/ENG/Preamble/index.php>
14. *Ibid*.
15. Gillam, Carey. 2015. Scientist defends WHO group report linking herbicide to cancer. *Reuters*. <http://www.reuters.com/article/2015/03/26/monsanto-herbicide-idUSL2N0WS1SC20150326>