

Monsanto's glyphosate now most heavily used weed-killer in history, study says

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Monsanto's signature herbicide glyphosate, first marketed as "Roundup," is now the most widely and heavily applied weed-killer in the history of chemical agriculture in both the U.S. and globally, according to a landmark report published today in the journal, *Environmental Sciences Europe*.

A paper published Feb. 2, 2016 in the peer-reviewed journal *Environmental Sciences Europe* reports that 18.9 billion pounds (8.6 billion kilograms) of glyphosate have been used globally. Glyphosate use has risen almost 15-fold since so-called "Roundup Ready" [genetically engineered crops](#) were introduced in 1996.

Enough glyphosate was applied in 2014 to spray over three-quarters of a pound of glyphosate active ingredient on every harvested acre of cropland in the U.S., and remarkably, almost one-half pound per acre on all cropland worldwide (0.53 kilogram/hectare).

The paper by Charles Benbrook, PhD, titled "Trends in glyphosate herbicide use in the United States and globally," and is available free, online at [*Environmental Sciences Europe*].

"The dramatic and rapid growth in overall use of glyphosate will likely contribute to a host of adverse environmental and public health consequences," noted Dr. Benbrook in his paper.

Last year, 17 of the world's top cancer researchers unanimously voted to

elevate the cancer profile of glyphosate on behalf of the World Health Organization. The WHO's International Agency for Research on Cancer (IARC) now classifies the weed-killer as "probably carcinogenic to humans" after the panel of experts reviewed all of the publicly available research. Following up on the action by the WHO, the state of California is currently in the process of listing glyphosate as a known human carcinogen under its Prop 65 law.

As the paper notes, recent studies have made the connection between glyphosate exposure and a number of serious health effects beyond cancer, including the degeneration of the liver and kidney, as well as non-Hodgkin lymphoma, among others.

Remarkably, 74 percent of all the glyphosate sprayed on crops since the mid-1970s has been applied in just the last 10 years as the amount of genetically engineered corn and soybean crops have exploded on both U.S. and global croplands.

First sold commercially in 1974, the use of glyphosate by farmers was limited since this active ingredient kills both weeds and agronomic crops. The development and approval of genetically engineered (GE), herbicide-tolerant (HT) crops dramatically changed how farmers could apply glyphosate. Starting in 1996, GE-HT versions of three major crops - cotton, corn, and soybeans - were marketed by Monsanto and other seed companies, making it possible for farmers to apply glyphosate for months after crops had started growing.

The use and efficacy of HT technology, particularly in its first decade, led to rapid and near-universal adoption in the U.S., Canada, Argentina, Brazil, and a half-dozen other countries. As a result, glyphosate use by farmers in the U.S. rose from 12.5 million pounds in 1995 to 250 million pounds in 2014, a 20-fold increase. Globally, total use rose from 112.6 million pounds in 1995 to 1.65 billion in 2014, a 14.6-fold jump.

"My hope is that this paper will stimulate more research on glyphosate use, and human and environmental exposure patterns, to increase the chance that scientists will quickly detect any problems that might be triggered, or made worse by glyphosate exposure," Benbrook added.

"This report makes it clear that the use of glyphosate combined with the dominance of genetically engineered crops has produced an looming [public health](#) threat both in the U.S. and around the world," said Mary Ellen Kustin, a senior policy analyst at EWG. "Farmers have sprayed billions of pounds of a chemical now considered a probable [human carcinogen](#) over the past decade. Spraying has increased to multiple times a year recently on the majority of U.S. cropland. The sheer volume of use of this toxic weed-killer is a clear indication that this chemical dependency is a case of farming gone wrong."

This is Benbrook's second paper published in *Environmental Sciences Europe*. The first, "Impacts of genetically engineered crops on pesticide use in the U.S. - the first sixteen years," was published in September 2012 and remains the most heavily accessed paper in the 25-year history of *Environmental Sciences Europe*, with over 230,000 reviews.

More information: Benbrook, C. Trends in glyphosate herbicide use in the United States and globally. *Environmental Sciences Europe* (2016, 28:28)

Charles M Benbrook. Impacts of genetically engineered crops on pesticide use in the U.S.—the first sixteen years, *Environmental Sciences Europe* (2012). [DOI: 10.1186/2190-4715-24-24](https://doi.org/10.1186/2190-4715-24-24)

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