

Glyphosate's Role in Preserving the Environment and Biodiversity



As the population grows, the agricultural industry is continuously working to grow healthy crops with less impact on the environment. That means using less land and natural resources, preserving biodiversity, reducing greenhouse gas emissions and helping to ensure that soils stay rich with nutrients.

Protecting Honey Bees and Preserving Biodiversity

Honey bees and other insects play an essential role in the production of many crops.

This is because many crops are not wind-pollinated but depend heavily on pollinating insects. Almonds are almost entirely dependent upon honey bee pollination, and without honey bees, there would be far fewer blueberries, squash, watermelon and other fruits to harvest. It's why farmers — and the broader agricultural industry — work so hard to protect honey bees through a variety of partnerships and initiatives.

It may sound surprising, but global honey bee populations have actually increased by 65 percent since the early 1960s.¹ And their continued growth is really important.

Honey bees face a number of challenges ranging from disease and forage, to the Varroa mite, to poor nutrition and weather. And because they are so critical to the environment, there has been much discussion about whether glyphosate-based herbicides could harm important pollinators and other beneficial arthropods.

In a study evaluating the potential effects of plant protection products at realistic worst-case exposure rates, "No adverse effects on adult bees or bee brood development were observed in any of the glyphosate-treated colonies." — National Institutes of Health.²

Glyphosate products have been extensively tested in the laboratory and in the field to evaluate potential toxicity to honey bees. This extensive testing has found that glyphosate products pose no acute or chronic adverse effects to honey bees.^{3,4,5} For example, a comprehensive study by Thompson et al (2014) found no adverse effects on adult bee survival or bee brood survival or development in honeybee colonies treated with glyphosate at levels that exceed environmentally realistic exposures.

In addition, regulatory authorities, such as the European Food Safety Authority (EFSA)⁶ and the U.S. Environmental Protection Agency (EPA)⁷, conduct comprehensive evaluations to ensure crop protection products, such as glyphosate, can be used safely for the environment. As part of this process, the regulatory authorities specifically evaluate the potential for effects on non-target organisms, including honey bees.⁷ Regulatory authorities only approve products that pose no unreasonable risk to the environment.

What researchers have also found is that by using glyphosate, farmers can ensure more productive harvests while using less land. This is a result of decreased competition, because weeds compete with crops for nutrients, water, sunlight and space. By decreasing the amount of land needed to grow crops, farmers can preserve the

important habitat and forage area that honey bees and other insects, birds, frogs and beneficial organisms need to thrive.

Extensive tests have been conducted to examine the potential impacts of glyphosate on wildlife. These studies play an essential role in governmental safety reviews of glyphosate and collectively they demonstrate that glyphosate's approved uses do not pose a threat to the health of animal wildlife.^{8,9}

Glyphosate products have been trusted for use in protected habitats such as the Galapagos Islands and the Florida Everglades to protect the native flora from invasive weed species.^{10,11}

Promoting Environmental Health Through No-Till and Reduced Tillage Practices

We aim to ensure bountiful harvests while preserving the environment. Through our work developing innovative products and solutions, we promote and are constantly seeking to improve sustainable farming practices.

Tillage, which involves turning over the soil, has been practiced as a form of weed control for generations. While tillage can be effective in controlling weeds, it also releases greenhouse gases stored in the soil and contributes to erosion — which can rob the soil of nutrients, make it difficult for soil to absorb water and cause runoff. Precise application of glyphosate-based herbicides can allow farmers to leave the soil intact, producing measurable environmental benefits that are contributing to a more sustainable future.

Improving Soil Fertility

Glyphosate has become a very useful tool for protecting soil fertility. One of the greatest benefits of glyphosate is its ability to foster healthier soils by reducing the need for tillage (or plowing).

By using glyphosate-based herbicides, farmers can leave their soil intact while the previous year's crop residue or organic matter remains on top of the soil. This significantly increases the amount of nutrients and microbes — tiny bacteria that assist plants as they grow — in the soil. **In addition to creating a thriving environment for plant roots, using no-till and reduced till practices has been shown to reduce soil erosion by as much as 60 to 90 percent.**^{12,13}

Reducing CO2 Emissions

We all contribute to climate change, which is caused by high levels of greenhouse gases like carbon dioxide that build up in the atmosphere and absorb the sun's heat.

In agriculture, the use of tilling, fertilizers, fuel and other tools naturally emits greenhouse gases. But unlike other industries, agriculture is uniquely capable of removing just as many — or more

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— greenhouse gases than it emits. All it takes is the right tools and solutions for healthy crops.

Scientists estimate that even if Europe alone used only conventional tillage to control weeds, the carbon dioxide emissions from cultivated soil would double.¹⁴ And that's without taking into account the greenhouse gas emissions released from the fuel and energy consumed by tilling machinery. **In 2014 alone, a decrease in tillage led to a reduction in carbon emissions equivalent to removing nearly 2 million cars from the road.**¹⁵

Preserving Water Sources

No-till and reduced tillage practices are key to keeping water safe and conserving this precious resource.

When farmers don't till, they help the soil retain water and moisture levels. More moisture in the ground means less runoff and more water readily available for crops, which reduces the need for irrigation.

Based on research and monitoring data, glyphosate does not pose a hazard to human health through surface water or drinking water and there is no evidence of any persistent groundwater contamination by glyphosate.¹⁶⁻³¹ Glyphosate has a unique combination of qualities that allow it to bind strongly to the soil, making it unlikely to leach into groundwater. And, it degrades into naturally occurring substances like carbon dioxide, nitrogen and phosphate.³²

Preserving the Future with Herbicide Stewardship

Like farmers, we think in generations. We aim to ensure bountiful harvests today and leave the planet and our communities in better shape for our children and the generations to come. In addition, we have a robust stewardship program in place to understand and minimize any potential negative impact on human health or the environment.

Here's how those safety measures are established: When a new herbicide — or any crop protection product — is introduced to the market, regulatory agencies closely scrutinize not only the effects that a product has on its target, but also the peripheral effects it may have on non-target areas, pests, animals, people and more. Only after a thorough assessment of each of these categories can farmers use a new product. And, most importantly, in most countries this scrutiny is recurring, as regulators routinely review such products and the scientific literature supporting their safety profiles.

In the past 40 years, thousands of studies have been conducted on glyphosate and reviewed by the EPA as researchers work to identify potential negative effects on humans or the environment.

The information obtained in glyphosate studies and the studies of other crop protection products is then used to establish how, when and where a product can be used safely.

Here are some of the stewardship measures currently in place:

Avoiding pollution of water — A crucial element of product stewardship is the development of clear label instructions, which outline very specific measures to reduce water contamination risks. Regulatory authorities conduct comprehensive evaluations in order to develop these product label instructions. The protection of water

on farms and downstream is vitally important. Although glyphosate binds strongly to soil particles and organic matter and is metabolized by microorganisms, farmers go to great lengths to avoid any potential spray drift and run-off.

Training for responsible use — Many farmers participate in training and certification programs to help ensure they are up-to-date on best practices for using crop protection products effectively and sustainably.

Adhering to international standards — The FAO International Code of Conduct for the Distribution and Use of Pesticides³³ sets out the principles of product stewardship, which are required to protect human health and the environment, while improving the productivity, sustainability and livelihoods of farmers.

“We want to explain the benefits that science and innovation can deliver in agriculture while championing what's important to people: safe, healthy and affordable food that is produced in an environmentally sustainable manner. Improving access to the science behind our products is a key part of our Transparency Initiative.”

— Liam Condon, President of the Bayer Crop Science Division

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