Texas A&M AgriLife Extension

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General Information About Glyphosate

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What is glyphosate

Glyphosate is an herbicide used to control a wide range of undesirable plants in lawns and gardens, row crops, pastures, aquatics, road sides, rights-of-way, and other managed areas. First introduced for use in 1974, glyphosate is now one of the most widely used herbicides in the United States. Today, there are over 750 products that contain this active ingredient for agronomic, commercial, and home use.

How does it work

Glyphosate kills a wide range of annual and perennial plants (grasses, broadleaves, and sedges) by preventing them from making 3 essential aromatic amino acids. It does this by inhibiting a specific enzyme, EPSP synthase, only found in plants and many bacteria.

Is it likely that glyphosate can cause cancer

Regulatory agencies charged with the risk assessment of substances and their impact to the public including Health Canada, European Food Safety Authority (EFSA), Food and Agriculture Organization (FAO) of the United Nations, World Health Organization (WHO), and the United States Environmental Protection Agency (US-EPA), all released findings of their assessments later in 2015, 2016 and 2018. Based on the most currently available research, these agencies have all concluded that glyphosate was unlikely to pose a carcinogenic risk to humans.

The International Agency for Research on Cancer (IARC) is a non-regulatory working group that considers current published research to determine if substances are potential carcinogens. In March 2015, IARC classified glyphosate as Group 2a "probably causes cancer". IARC only assesses the potential carcinogenicity of a substance and does not consider exposure or conduct risk assessment.

Concerns about glyphosate in food

Pesticides undergo rigorous testing and risk assessment by regulatory agencies to evaluate the potential for harm to humans, wildlife, fish, and other non-target organisms. Human health risks are evaluated rigorously, including considerations for sensitive groups such as children and immune-suppressed individuals.

Regulatory agencies such as the U.S. EPA have carefully reviewed existing data on risks caused by exposure through residues in food, water, residential uses, and occupational risks to those applying the product. A baseline exposure dose is identified using experimentally determined metrics defined as the lowest dose at which adverse effects are seen (LOAEL) or the dose at which no adverse effects are seen (NOAEL). The U.S. EPA then sets daily exposure limits at least 100 times below the NOAEL established in these safety studies.

An important part of the regulatory process involves setting tolerances, which are the maximum amount of pesticides that may legally remain on or in food and animal feed. The Food and Drug Administration (FDA) is responsible for ensuring that chemical residues on or in domestic and imported foods do not exceed the limits established by the U.S. EPA. In 2016, the FDA began testing for glyphosate residues and preliminary results showed no pesticide residue violations in all four commodities tested (soybean, corn, milk, and eggs).

How to make an informed decision

Consider the source of information and what their credibility is for providing accurate and un-biased information.

Remember that risk is a function of both the toxicity and exposure to a substance. A substance can be extremely toxic and yet presents low risk if you have little to no exposure to it. In the same way, a substance that you are exposed to every day may pose little to no risk, if it has low toxicity.

Glyphosate containing products as well as other herbicides are low risk to use when you follow the directions provided in the federal pesticide labels, which include using appropriate rates and wearing proper PPE (Personal Protective Equipment). Based on current research, glyphosate has been shown to pose no appreciable health risk when consuming a normal diet.

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