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EDC Insights No.5 - Glyphosate

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What is Glyphosate?

Glyphosate is the world's most widely produced herbicide, also known as GBH (glyphosate based herbicide). It is an active substance used as broad-spectrum herbicide; it is non-selective and does not target specific weeds. When sprayed directly onto leaves it is absorbed and moves into plant sap, eventually killing the entire plant, including the roots.

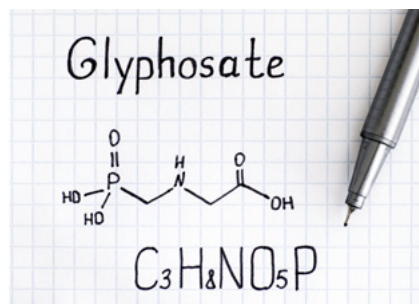
Glyphosate remains in soil whilst it breaks down; its chemical half-life has been reported by the US Department of Agriculture with a range from 3 days to 200+.

Glyphosate has been held accountable for a wide range of ecological problems including destruction of wildlife and fauna.

It is used in hundreds of products in agriculture, forestry, and home gardening. Its use is surrounded with controversy about its safety – the answer depends on who is answering the question.

Glyphosate is sold globally under the brand name Roundup along with hundreds of other brands. It was introduced by chemical company Monsanto in 1974.

Glyphosate usage has since amplified, especially with the introduction of genetically modified (GMO) glyphosate-resistant crops, with the combined effect of higher yields.



Health risks of glyphosate

Exposure to glyphosate is known to cause irritation to the eyes, skin, and nose if inhaled. If swallowed it can cause irritation to the throat, burning pain in the mouth, and nausea.



IS GLYPHOSATE CARCINOGENIC?

This is one of the most contested debates in the chemicals industry – producers fiercely defending its safety, whilst action groups lobby for it to be banned because of the risk it poses to human and animal health.

In 2015 the World Health Organization classified glyphosate as “probably carcinogenic” to humans, identifying it as a Tier Two, or 2A chemical, meaning that regulation is needed. Substances falling into

level one are carcinogenic (based on weight of evidence) and despite its widespread use, there is still insufficient evidence to classify glyphosate as level one.

The EU have recently taken a different view. In May 2022, the European Chemicals agency published their review of the health risks of glyphosate. It concluded that there is insufficient evidence to change their classification to carcinogenic, at odds with the WHO classification of 2015.

The existing EU classification identifies glyphosate as a substance that causes damage to eyes and aquatic life, with lasting effects.

CAN GLYPHOSATE CAUSE CANCER?

Glyphosate exposure is widely thought to be a cause of many chronic health problems, and most significantly, cancer.

Cancers linked to glyphosate exposure include non-Hodgkin lymphoma, renal tubule carcinoma, pancreatic islet-cell adenoma, and skin tumours.

However, given the difficulties in proving cause and effect, even in rigorous scientific studies, scientific opinion remains divided. Some studies have established strong causal links between glyphosate and cancer, but others have found insufficient data to reach the same conclusions.

For example, some animal studies have been criticised for the duration of the study; cancer cells can take a long time to develop to mimic a comparable exposure time in humans.

Glyphosate has been at the centre hundreds of legal cases in the US brought against manufacturers by employees experiencing ill health because of occupational exposure.



OTHER HEALTH RISKS

Glyphosate has been linked to many illnesses including **disruption of the endocrine system**, fertility, and reproduction.

A vast range of diseases such as autism, metabolic disorder, diabetes, depression cardiovascular disease, and autoimmune disease have also been linked to glyphosate exposure.

How are we exposed to glyphosate?

Glyphosate can enter the body through the skin, by eating foods treated with glyphosate, and by drinking or bathing in water contaminated with glyphosate.

Glyphosate has been detected in food, fish, baby food, berries, water, and dust.

How does glyphosate work inside the body?

Studies have indicated that glyphosate disrupts the microbiome in the intestine, causing a decrease in the ratio of beneficial to harmful bacteria.

The relationship between the microbiome of the intestine and overall human health is still unclear, but research suggests that disruption of the microbiome could cause a wide range of adverse health effects.

Glyphosate may have other adverse health effects including stressing bodily detoxification mechanisms, disruption of cell membranes, and the possibility of synergistic effects with other chemicals in the environment.

Glyphosate is considered as a "super" endocrine disrupting chemical by some in the scientific community, but there is still conflicting evidence due in some part to the difficulties of isolating glyphosate from other environmental exposures.

Can glyphosate be detected in the body?

Glyphosate can be detected in urine.

Glyphosate is readily metabolised in the body, passing through unchanged. The body does not appear to store it like other chemical substances, leaving no detectable **body burden**. Although it passes quickly through the body its effects are often seen as a result of regular exposure, which is considered the greatest concern to our health.

A few studies have detected glyphosate in animal cell tissue and bone marrow.

How is glyphosate regulated?

In the EU Glyphosate is permitted for use in Plant Protection Products until December 2022 when it will be reviewed. There is an ongoing review process; the battle between producers and governments rages on.

It is legal to use in the UK with restrictions in some settings such as usage amenity areas to protect public health.

Glyphosate does not appear on the **UK SVHC list** or **ChemSec's SIN list**. This does not mean that it is considered safe to use but reflects how difficult it is to gather strong scientific evidence on such a widely used chemical that would be hard to substitute.

Can you reduce exposure to glyphosate?

The prevalence of glyphosate in the food chain is a compelling reason to switch to food that has been grown organically without artificial chemicals. Filtering drinking water is also advisable.

Exercise that raises the heart rate will help to expel toxins including glyphosate from the body, and saunas and hot baths with Epsom salts also have a detoxifying effect.

The most effective way to reduce glyphosate exposure is to avoid living in areas where glyphosate is applied, but this may be difficult to achieve for some.

When used in occupational settings it is advised to wear protective clothing and face coverings whilst spraying glyphosate.



IN YOUR GARDEN

Roundup and other glyphosate brands line the shelves of many garden centres, reinforcing the message that it is safe to use. Its efficacy at bringing weeds under control is unquestionable, but glyphosate is essentially a plant poison.

It is extremely easy to avoid with traditional, non-chemical weeding methods. If glyphosate is needed then always spray at arm's length, wear long sleeves and gloves, and avoid inhaling it at all costs.

THE HEALTH LIABILITY STORY OF ROUNDUP – A COMMENTARY FROM BOB WOODS, MBE.

There has long been concern about glyphosate which could be described as the world's herbicide, first introduced by Monsanto in 1976 and acquired by Bayer in 2018.

French Professor and molecular biologist, Gilles-Eric Séralini has campaigned for more than 10 years on the probable harm caused by glyphosate, albeit controversially. His research has been aggressively attacked to the extent that some journals subsequently retracted his papers.

To date, Monsanto has reached settlement agreements in nearly 100,000 lawsuits with a further 25,000 active lawsuits. The first Roundup cases went to trial with disastrous results for Bayer.

\$80 million in damages (later were reduced to \$25m) were awarded to Edwin Hardeman in 2019 after a ruling that his non-Hodgkin's lymphoma was caused by his use of Roundup. In June 2022, a jury in Missouri ruled in favour of Bayer that Roundup did not cause a complainants' non-Hodgkin's lymphoma.

Consequently, Bayer now prefers to negotiate settlements out of court setting aside some \$16 billion for this purpose. In July 2021 Bayer announced its plan to stop selling Roundup for domestic use. At the same time, it set aside a further \$4.5 billion for potential future legal claims. To date it has settled more than 107,00 cases. **The total amount of past and future claims could reach \$14 billion.**

It is worth remembering that toxicity data is not available for many pesticides, food additives, cosmetics, and drugs. Of those that are tested, the use of animals in a laboratory is used as a proxy for humans. Epidemiological studies attempt to analysis the effect on human populations, but this is invariably based on adults. However, it is believed that children, particularly very young children, may be very much more susceptible to the toxic effects of environmental chemicals.

Bob Woods notes:

“When faced with a decision whether to ban such herbicides, governments legislative and regulated bodies are faced with an exceedingly difficult dilemma – an industry which has spent substantial amounts of money funding research to support their contention that their products are safe, along with the knowledge that to ban the world's herbicide would put up food prices in the absence of any alternative.”

Bob Woods MBE is lastinghealth's sponsor. **In this video he explains how exposure to everyday chemicals were affecting his health.**

Bayer continue promote glyphosate safety on their **website**.