

(advocacy)

Does Roundup cause cancer?

Glyphosate is the active ingredient in Roundup and related non-selective herbicide products. Roundup is one of the most widely used herbicides in the world, and, in my experience, is applied on most U.S. golf courses. So, when people raise concerns about glyphosate's carcinogenicity — its potential to cause cancer — golf course superintendents are a particularly interested party.

That interest was piqued last year when the International Agency of Research on Cancer (IARC) of the World Health Organization (WHO) placed glyphosate in carcinogenicity category 2A, meaning that it's "probably carcinogenic to humans" (1). More specifically, the IARC committee concluded there was limited evidence of carcinogenicity in humans for non-Hodgkin lymphoma, convincing evidence that glyphosate causes cancer in lab animals (mice and rats), and strong evidence that it is genotoxic (impacts genetic material).

So that's it, then, right? An authoritative scientific group has established that glyphosate is a probable human carcinogen. Case closed. Purge your stocks. Tell your green committee the allegations they've been reading on the internet are correct.

Not so fast. Most of the scientific and regulatory world disagrees with the IARC committee, including another WHO committee (keep reading), the EPA and a number of foreign regulatory agencies (Canada, Germany, Australia, etc.). So, how did the IARC reach its conclusion?

The committee seems to have been somewhat selective in the studies it reviewed, and it didn't consider actual glyphosate exposure levels. The EPA recently (September 2016) completed a more comprehensive evaluation of scientific studies, and it concluded that glyphosate is "not likely to be carcinogenic to humans

at doses relevant to human health risk assessment" (2). This is consistent with a 2015 conclusion from the EPA's Cancer Assessment Review Committee, which stated that glyphosate is "not likely to be carcinogenic to humans."

For its 2016 determination, the EPA reviewed 15 animal carcinogenicity studies, 90 genotoxicity studies and 23 epidemiological studies. (The latter type of study examines the relationships between the distribution and causes/risk factors of specific diseases, attempting to link causes and effects.) Both the EPA's 2016 and 2015 glyphosate determinations are in agreement with its assessment from 1991, which, under a different carcinogenicity classification scheme, placed glyphosate in category E, designating "evidence of non-carcinogenicity in humans."

A sister committee of the WHO's IARC committee — the Joint Food and Agriculture Organization of the United Nations/WHO Meeting on Pesticide Residues (JMPR) — recently issued its own report on glyphosate (3), and some of its key conclusions differ significantly from the IARC analysis. The JMPR report says that, "In view of the absence of carcinogenic potential in rodents at human-relevant doses and the absence of genotoxicity by the oral route in mammals, and considering the epidemiological evidence from occupational exposures, the Meeting concluded that glyphosate is unlikely to pose a carcinogenic risk to humans from exposure through the diet."

Additionally, near the end of September 2016, four expert panels also published their conclusions (4), which are consistent with those of the EPA.

Looking ahead

The EPA has asked an outside panel of expert scientists — the Scientific Advisory Panel (SAP) — to critique its 2016 analysis of glyphosate's carcinogenicity and genotoxicity. The SAP is expected to issue its report in January. After EPA scientists have read the SAP report and made any changes to their human

health assessment of glyphosate, that assessment will be released for public comment.

On your home turf, when it comes to fielding questions about glyphosate and communicating the risks, what can you say to a concerned member who may ask, "Do you spray that carcinogenic pesticide glyphosate all over the course?" Explain that regulatory scientists who look at such matters for a living, including the EPA, have determined that glyphosate is not likely to be carcinogenic to humans. Just one international committee of the World Health Organization concluded that glyphosate is a probable human carcinogen, and that committee was selective in the studies it reviewed and did not take into account varying levels of exposure to the herbicide. Another World Health Organization committee, along with the EPA and many foreign governments, reached the opposite conclusion of that sole group.

You can also assure those who visit the golf course that glyphosate is not sprayed indiscriminately "all over the course," and that if that were the case, there would be no turf remaining for them to play golf on. Inform them that you only apply glyphosate products by hand, as spot applications, often directly to invasive species of weeds.

References:

1. www.iarc.fr/en/media-centre/iarcnews/pdf/MonographVolume112.pdf
2. www.epa.gov/sites/production/files/2016-09/documents/glyphosate_issue_paper_evaluation_of_carcinogenic_potential.pdf
3. www.who.int/foodsafety/jmprsummary2016.pdf
4. www.ncbi.nlm.nih.gov/pubmed/27677666

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