

TerranearPMC Safety Share

Robert Brounstein

Week of October 15, 2018 – Glyphosate

Earlier this year, a legal decision was announced, declaring that Roundup, the most popular weed killer in the world, gave a former school groundskeeper terminal cancer. The groundskeeper, 46 years old, applied Roundup weed killer 20 to 30 times per year as part of his job. He testified that during his work, he had two accidents in which he was soaked with the product. The first accident happened in 2012. Two years later, in 2014, he was diagnosed with non-Hodgkin's lymphoma (a cancer that originates in the lymphatic system and spreads throughout the body, resulting in tumors in lymphocytes – a type of white blood cell). During the trial, the groundskeeper stated that on bad days, he is too incapacitated to talk while he has lesions that cover about 80% of his body. As a result of this legal decision the plaintiff (groundskeeper) was awarded \$289 million in damages: mostly to punish the manufacturer.

Since this decision, commercials for legal action aimed at potential victims of those that have used Roundup, have appeared of television commercials with the intention of filing a class action lawsuit.

Meanwhile, the manufacturer of Roundup, has voiced their intention to appeal the decision, insisting that the product's 40-year history is evidence that Roundup is a vital, effective and safe tool for farmers and other users.

The component of Roundup which was in legal question is glyphosate; a substance that the International Agency for Research on Cancer (IARC) issued a report (2015) which indicated related health effects due to its use, thereby classifying this material as "*probably carcinogenic to humans.*" Concurrently, the defense for using Roundup is based on the claim that IARC's report is contrary to a great number of other studies that have concluded that glyphosate is safe. This includes over 800 scientific studies performed by such organizations as the US EPA, the National Institutes of Health and regulators around the world: all stating that glyphosate is safe for use and does not cause cancer. A review of IARC's report on glyphosate by numerous toxicologists all expressed concerns pertaining to the reliability of IARC's study. One such review states,

“The UK Committee on Carcinogenicity has evaluated possible links between pesticide exposure and cancer on several occasions. It has found little evidence for such a link. At most, the evidence was inconsistent and was considered insufficient to call for regulatory action.”

So why are there conflicting conclusions within the scientific community and maybe more importantly, how could any conclusive decision be made with such a disparity of expert research? The big question at stake is whether Roundup can cause cancer and, if so, whether the manufacturer of this product failed to warn consumers about the product's cancer risk.

IARC has five Groups for which to classify carcinogens. Each group is defined by various studies that focus on a substances' ability to cause cancer in humans in addition to experimental evidence based on animal experiments.

1. Group 1: Carcinogenic to humans. Where there is significant evidence of carcinogenicity OR sufficient evidence of carcinogenicity for experimental animals
2. Group 2A: Probably carcinogenic to humans. Where there is limited evidence of carcinogenicity AND sufficient evidence of carcinogenicity for experimental animals.
3. Group 2B: Possibly carcinogenic to humans. Where there is limited evidence of carcinogenicity in humans and less than sufficient evidence of carcinogenicity in experimental animals.



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4. Group 3: Not classifiable as to its carcinogenicity to humans. Where there the evidence of carcinogenicity is *inadequate* in humans and *inadequate* or *limited* in experimental animals.
5. Group 4: Probably not carcinogenic to humans. Where the evidence suggests a *lack* of carcinogenicity in humans and in experimental animals.

Many have heard of IARC's parent affiliate, the World Health Organization or WHO, but still are not familiar with this organization as well as its influence in the US. WHO is a specialized agency of the United Nations that is concerned with international public health. It was established in 1948, and is headquartered in Geneva, Switzerland. Its predecessor, the Health Organization, was an agency of the League of Nations (started in 1920).

IARC is one of the organizations (along with the American Conference of Industrial Hygienists, National Toxicology Program and OSHA) that is listed on Safety Data Sheets (SDSs) in toxicological section (section 11) that designates if the material is a carcinogen. An internet search for glyphosate SDSs shows a consistency that this material is marginally a health concern; some mention possible liver changes after repeated overexposures while concluding that glyphosate shows no evidence of genetic or carcinogenic effects. It is typical to see the March 2015, IARC study referenced in SDSs noting that IARC's "... 'probably carcinogenic to humans' classification is based on 'limited human evidence and some evidence in animals.'"

It seems that the current legal predicament stems from the fact that while it is medically impossible to prove Roundup caused the terminal illness of the groundskeeper, it's also impossible to prove that Roundup did *NOT* cause his cancer. According to the American Cancer Society, the majority of lymphoma cases are idiopathic: meaning the cause is unknown. Testing to see if something can cause cancer in humans is often difficult as scientists get much of their data from lab studies in cell cultures and animals, and the translation from animals to humans is rarely a direct relationship.

Although lab studies alone can't always predict if a substance will cause cancer in people, virtually all known human carcinogens that have been adequately tested also cause cancer in lab animals. In many cases, carcinogens are first found to cause cancer in lab animals and are later found to cause cancer in people.

While the active component of Roundup, glyphosate, is an organophosphate, unlike other organophosphates found in pesticides and insecticides; glyphosate's toxicological target is not the central nervous system and, as a herbicide, Roundup is designed to kill only weeds; specially, annual broadleaf weeds and grasses that compete with crops. This does not mean using or handling glyphosate cannot cause adverse health effects. Therefore, as with any potentially harmful material, working with chemicals, in general, requires our attention and proper use. And while glyphosate *May Not* be as harmful as other organophosphates, employers do have a responsibility to ensure their workers are properly protected through proper PPE (respiratory protection, coveralls, etc.), annual fit-for-duty exams and to train their staff on proper use and handling. Through the requirements of the OSHA Hazard Communication Standard and corporate employee empowerment programs, appropriate practices can indeed, help to ensure safety and health in the workplace when working with hazardous substances.

All things are poison, and nothing is without poison, the dosage alone makes it so a thing is not a poison – Paracelsus

