

## Viewpoint: Many web-surfing gardeners are concerned about the scary claims they read online about the herbicide glyphosate. An independent university weed scientist addresses the controversy

**I**n my role as the Consumer Horticulture Agent with the North Carolina Cooperative Extension, I am often asked about the herbicide glyphosate. Is it harmful to humans and the environment as many advocacy groups claim? To address those concerns, I turned to an unbiased expert, Dr. Joe Neal, North Carolina State Professor of Weed Science. He has put together a talk that everyone should hear: “Glyphosate: Can we separate fact and fiction? And, how do we control weeds without it.” His talk before a NC State Extension Master Gardener class was illuminating. He was succinct and science based, and I wanted to share it with you.

Dr. Neal did an amazing job explaining the facts and fiction surrounding the product. He discussed the science behind the World Health Organization’s (WHO) International Agency for Research on Cancer finding that glyphosate is “probably carcinogenic to humans” while another division of WHO, the Joint FAO/WHO Meeting on Pesticide Residues concluded that “glyphosate is unlikely to pose a carcinogenic risk to humans...”. In fact, no other major national regulatory agency in the world classifies glyphosate as a probable carcinogen. He went into detail about how New Zealand’s Ministry for Primary Industry took this a step further in showing the difference between a hazard assessment and a risk assessment. The other parts of the discussion concerned the food levels of glyphosate, risk assessment, personal protective equipment, pesticide safety classification for conventional and organic pesticides, and alternatives that are available in place of glyphosate.

Joe Neal photo type unknown

Dr. Joe Neal. Credit: Hoffman Nursery

A hazard assessment tests the possibility of danger. Picture a busy street in a city that never stops. Would you cross the street with cars coming? There is a good chance you will get hurt! The cars are a hazard, Does this mean that we should outlaw all cars? Now would you cross if the light indicates it is safe to cross? That light telling you to go is your personal protection equipment (PPE). This minimizes the hazard. Risk on the other hand is a factor of hazard times exposure. We have the hazard but what is the likely exposure to the hazard if you are using your PPE and following the label for the product? By the way, fun fact, the LD50 (lethal dose, given all at once, in 50% of test subjects, expressed in mg/kg of body weight) of glyphosate is 5600 mg/kg, the LD50 for caffeine is 200 mg/kg. I hope you aren’t reading this while drinking your morning dose of caffeine!

Inevitably, these discussions then turn towards residue in foods. Is there glyphosate residue in our foods? Yes. Is it dangerous and is it going to cause cancer in all of us? Studies are done on this subject as well. The Environmental Protection Agency calls it the NOAEL – No Observed Adverse Effect Level. They find this level through scientific study and then add a 100-fold safety factor to it to define the level at which chronic exposure over a prolonged period may result in adverse effects. Using this factor, a 175-pound person would have to consume 2,285,714 carrots per day for a period of two years to reach the threshold. Don’t eat carrots, how about 3,389,831 bananas per day for two years? Not a fruit or vegetable fan? How

about 12,454, 12-ounce beers per day for a period of two years?

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Now, I say all of this to get to the nuts and bolts of this thing, no matter what the chemical, we need to be using it correctly. Are there hazards? Absolutely. Are there risks? You bet. How do we minimize our exposure and therefore lessen the risk of the hazards? Use your PPE and read the chemical's label entirely. Wear waterproof gloves and shoes with long pants. Wash your PPE according to instructions. This really goes back to common sense; does it matter if a gun is loaded or not? Always treat a gun as if it was loaded, always treat one of these chemicals as if it were a loaded gun.

Do you want to go organic? OMRI approved herbicide chemicals carry warning labels too. You must still read the label and take the proper precautions using correct PPE and application procedures. NC State has resources for you too including a factsheet for glyphosate alternatives (<https://content.ces.ncsu.edu/are-there-alternatives-to-glyphosate-for-weed-control-in-landscapes>).

You can get more information on glyphosate and other chemicals by visiting the NCSU Weed Management Portal at <https://weeds.ces.ncsu.edu/>. This site is a wealth of information that contains factsheets on herbicides, damage factsheets, weed ID, and management resources. Get the facts and make an informed decision about what you want to do and how you want to do it.

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