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The new DDT

Activist Jeffrey Smith teams with rocker Neil Young to warn communities about glyphosate

By Mollie Putzig

It's sprayed on crops, schoolyards, parking lots and possibly your yard. The World Health Organization says it probably causes cancer. It's the world's most-used herbicide and the active ingredient in Roundup: glyphosate.

On July 7, Jeffery Smith, activist and author of *Seeds of Deception: Exposing Industry and Government Lies about the Safety of the Genetically Engineered Foods You're Eating*, implored Boulder County Commissioners to stop spraying the herbicide on Boulder's public parks and open spaces. The City of Boulder already banned Roundup in 2011 in favor of safer alternatives, and Smith hopes the county — and the rest of the nation — will follow suit.

"Some scientists who've been looking at [glyphosate] think it's causing more illness than any other chemical on the planet because of how much it's being used," Smith says. "There are more toxic chemicals out there, but the overall impact of Roundup and glyphosate may be greater because of its use in the hundreds of millions of pounds."

Smith, who is also the founder of the Institute for Responsible Technology, is traveling with Neil Young's summer 2015 Rebel Content Tour, which features Young's newest album, *The Monsanto Years*. Smith's mission on the tour is to tell communities along the way about the institute's Ban Glyphosate Campaign.

Glyphosate is the keystone product of agricultural biotech giant Monsanto, who patented the chemical as an herbicide in 1969. The chemical kills plants by stopping the production of an enzyme used in the production of aromatic amino acids in the shikimate pathway (a metabolic process). For more than 40 years Monsanto has said glyphosate is safe because humans don't have a shikimate pathway — but something inside us does.

Microbes in the human body outnumber our own cells 10 to one. They live inside us, helping digest our food and training our immune systems to ward off disease. They rely on the shikimate pathway.

"We don't use the shikimate pathway in our tissues, but gut bacteria uses the shikimate pathway to produce these amino acids to produce — and you've probably heard of these — serotonin, melatonin, dopamine," Smith says. "If they're not produced in sufficient quantities then you end up with mood and behavior disorders, insomnia, pain problems, problems regulating blood sugar and even the inability to know when you're full."

"Monsanto will deny it," Smith says. "Some of it is very well understood and some of it is speculative based on what we know [glyphosate] does ... No one has tested serotonin levels [in humans] after eating glyphosate ... but we know that it blocks the shikimate pathway, the shikimate pathway produces L-tryptophan, L-tryptophan produces serotonin. So it's not that speculative."

Scientists don't yet fully understand the functions of the microbiome. Researchers at the University of Colorado Boulder's BioFrontiers Institute have found that it's affected by everything we do, from where and how we are born, to the food and chemicals we ingest. Medical researchers suspect that changes to our communities of microscopic organisms are linked to obesity, diabetes and certain cancers. They know that antibiotics play a significant role in the life of those microbes.

In addition to acting as an herbicide, glyphosate is a powerful antibiotic. Monsanto got a patent from the U.S. government to use glyphosate as an antibiotic in 2010. Like any antibiotic it kills the good along with the bad. The Centers for Disease Control and Prevention began warning about overuse of antibiotics in 2013 because they are concerned about antibiotic-resistant infections. The more antibiotics we use, the more bacteria develop resistance to them.

"An antibiotic usually you get a prescription for," Smith says. "Here's a very powerful antibiotic that has a broad spectrum capacity for killing bacteria and it's sprayed on our food — it's in our water; it's in our air."

In the mid '80s the Environmental Protection Agency (EPA) determined that glyphosate caused cancer in mice, but they took it back in 1991 after reevaluating the study, according to the *New York Times*. Then, as now, they only tested glyphosate rather than the full chemical cocktail of Roundup. A 2014 study in France found that Roundup is 125 times more toxic than glyphosate alone. Contrary to its reputation as harmless, Roundup was "by far the most toxic" of the six herbicides and insecticides the French study examined.

In 2013, the EPA raised the allowable limits of glyphosate residue on food — from 20 parts per million to 40 parts per million in oilseed crops. And foods like carrots, sweet potatoes, beets and onions can now be sold with 15 to 25 times more glyphosate than previously allowed. Paradoxically, an EPA fact sheet about glyphosate says that chronic long-term exposure to high levels of glyphosate can cause kidney damage and reproductive problems.

Before it became a weed killer, glyphosate was used as a chemical descaler, cleaning mineral deposits out of pipes and boilers. The metal chelating properties of glyphosate have invited speculation as a possible cause of a mysterious kidney disease attacking farmers in Sri Lanka, India and parts of Central America. Chronic Kidney Disease of Unknown etiology — called such because its cause is a mystery — has killed more than 20,000 in Sri Lanka alone and has been on the rise for decades.

A study published in the *International Journal of Environmental Research and Public Health* posits glyphosate is to blame. Glyphosate bonds with heavy metals like arsenic and cadmium, and it smuggles them through the liver and into the kidney. There the bonds break, and together the toxins destroy the kidney. The study suggests that high use of Roundup in an area where arsenic and cadmium are known to exist could be causing the epidemic.

The World Health Organization lists possible causes of the disease as arsenic, cadmium, pesticides, hard water consumption, dehydration and exposure to high temperatures.

Monsanto has brushed off claims that glyphosate may be linked to kidney problems. Even so, complete to partial bans on glyphosate have popped up in Colombia, Sri Lanka, Denmark, France, the Netherlands and California.



Courtesy of the Institute for Responsible Technology

"One of the issues that we're dealing with is the power of Monsanto to disinform and highjack regulatory bodies here and around the world," Smith says.

Monsanto was convicted of false advertising first in New York and then in France, where claims that glyphosate was readily biodegradable were refuted. Their own science showed that only 2 percent of glyphosate biodegrades in 28 days. Even after losing the case in New York they continued the false ad campaign in Europe.

"They continued to advertise it falsely in Europe until they were convicted there and had to pay 28,000 euros," Smith says. "From a business standpoint, it paid to lie, but from an ethical standpoint, it's been a disaster.

"We believe there's significant justification for an immediate ban," Smith says. He wants glyphosate eliminated not only from the 100,000 acres in Boulder County's jurisdiction, but also from school grounds and other private lands where it's use is up to citizens.

The EPA has a list of "minimum risk" pesticides that can be used in place of Roundup. They rely on products such as citric acid, corn meal, garlic and mint instead. When the City of Boulder banned Roundup, it switched to "mechanical means" or good oldfashioned weeding.

"Boulder is really a lighthouse for the nation in organic, natural and healthy living," Smith says. "Everyone in Boulder knows that. It makes complete sense that Boulder takes the leadership in this area."