

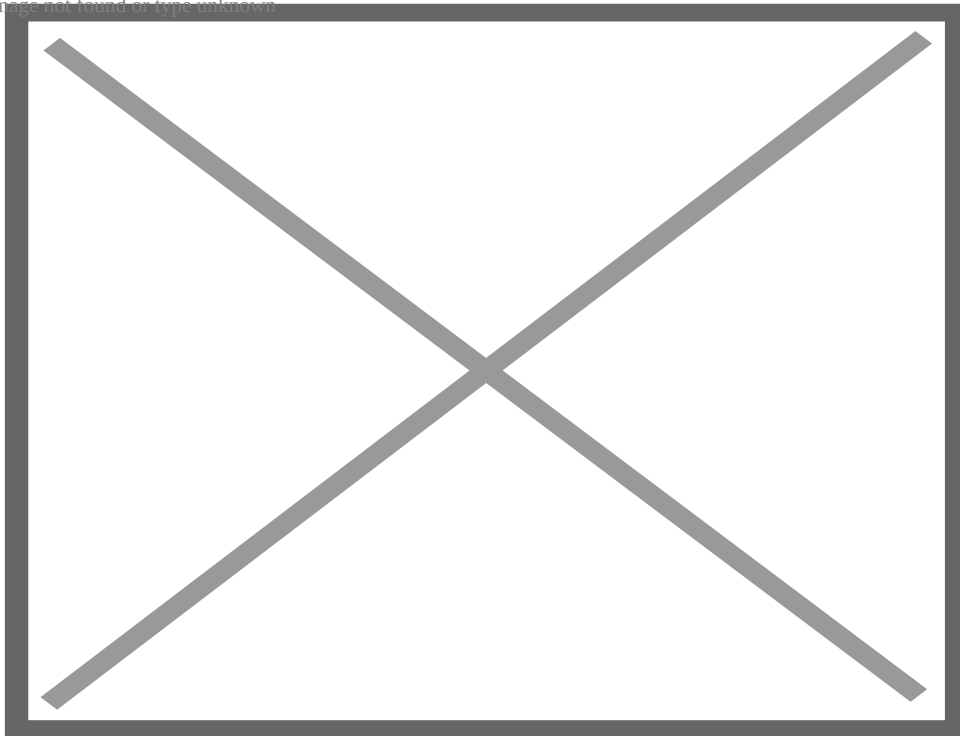
Do GMO farmers ‘douse’ their fields in glyphosate and other agrochemicals?

Stories suggesting that farmers ‘slather’ their crops with pesticides abound on the Internet. A few examples: [Controversial insecticide use rises as farmers douse seeds](#); [Top 10 Fruits Doused In Toxic Chemicals](#); and [GMO companies are dousing Hawaiian island with toxic pesticides](#) are examples. Critics, such as Bronners’ Magic Soaps, [argue](#) that a surge in chemical usage is being covered up by the ‘corporate controlled’ news outlets and blogs:

Mainstream pro-GMO media fail to discuss the ever-increasing amount of older much more toxic herbicides like 2,4 D and Dicamba being sprayed along with huge volumes of Glyphosate to deal with superweeds. Most importantly and egregiously, this biased reporting does not mention the imminent approval of the pesticide industry’s next generation herbicide-tolerant crops that are resistant not only to glyphosate, but also high doses of 2,4 D and Dicamba, that will lead to huge increases of these toxic chemicals sprayed on our food and farming communities.

These blogs and articles are often accompanied by scary infographics showing farmers spraying what appears to be massive amounts of chemicals.

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“When you hear or read about farmers “slathering,” “drenching,” or “dousing” their fields, remember that these emotive terms and mental images are at best, misleading, and frequently, manipulative,” [maintains](#) Steve Savage, an agricultural consultant. He wrote:

Most crop protection products are applied in the range of 3 — 64 oz. per acre. One reason people may imagine high pesticide use rates are the images of the spraying process. Most pesticides are delivered in a water spray. To be clear, that spray is almost all water. For something like an herbicide application to a row crop, the “spray volume” might be only five gallons of water per acre, again delivering a few ounces to maybe two quarts (64 oz.) of actual pesticide. How does a farmer’s use of five to 400 gallons per acre of water compare to the emotive terms “drenched” or “doused?”

‘Dousing’ claims irk farmers such as Dave Walton, who grows both non-GMO and genetically engineered soybean and corn, and is a member of the Iowa Soybean Association board. He writes:

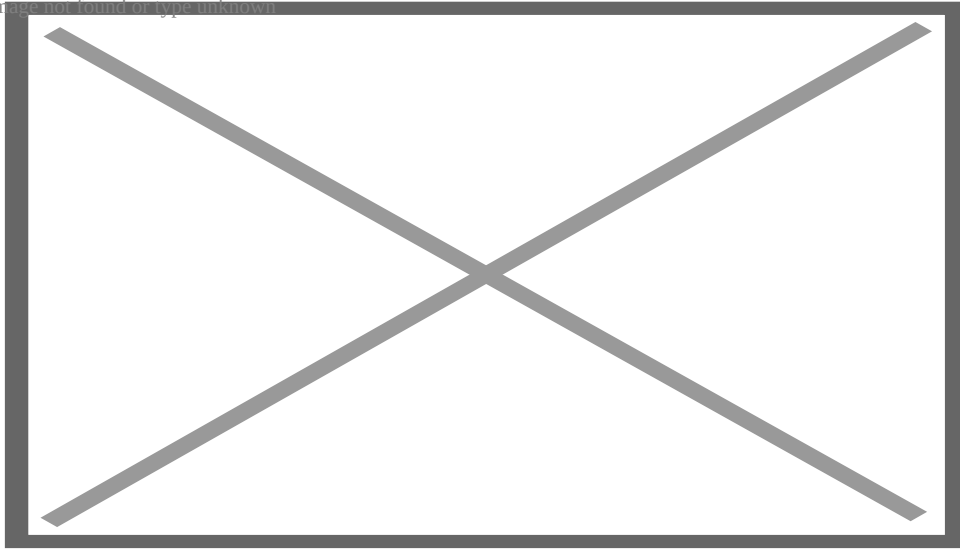
So, what about this drowning we’ve been reading so much about? On our corn ground, before planting we apply 16 ounces of Glyphosate, 8 ounces of 2,4-D, and 48 ounces of metalachlor per acre. To put that in perspective, it’s a little more than half a gallon of herbicide spread out over an acre, or roughly the size of a football field. *For soybeans, it’s even less. We start with the same 16 ounces of glyphosate and 8 ounces of 2,4-D, but also add 2.5 ounces of the pre-packaged mix. The pre-mix is a dry ingredient, so we’re putting on a pint and a half plus a couple tablespoons worth of herbicide on that same football field sized area.*

Jennie Schmidt is a dietitian turned farmer, growing grains, vegetables and wine grapes on a family farm on the Eastern Shore of Maryland. She [challenges the ‘dousing myth’](#):

When we spray, we don’t “douse”. The definition of “douse” means to drench or to pour. which is exactly what we are NOT doing. First, ALL pesticides (fungicides, insecticides, and herbicides) whether they are organic or synthetic have a “rate per acre” which is the concentration they should be mixed and applied to be effective against a target pest. Second, all pesticides (fungicides, insecticides, and herbicides), whether organic or synthetic have a “carrier”. A carrier is the means by which a pesticide is conveyed or transported. Most typically this carrier will be water.

The sprayer is used in our tomatoes, green beans, wheat, corn and soybeans. We are spraying at the 15—20 gallons per acre rate for herbicides or if the crop including our vegetables needs a fungicide, we are spraying at the 30—35 gallon per acre rate. It’s a 750-gallon tank so using 15 gallons per acre, this sprayer can cover 50 acres per tank. This equals 2,178,000 square feet. 96,000 ounces in that spray tank /2,178,000 square feet = 0.04 ounces per square foot.

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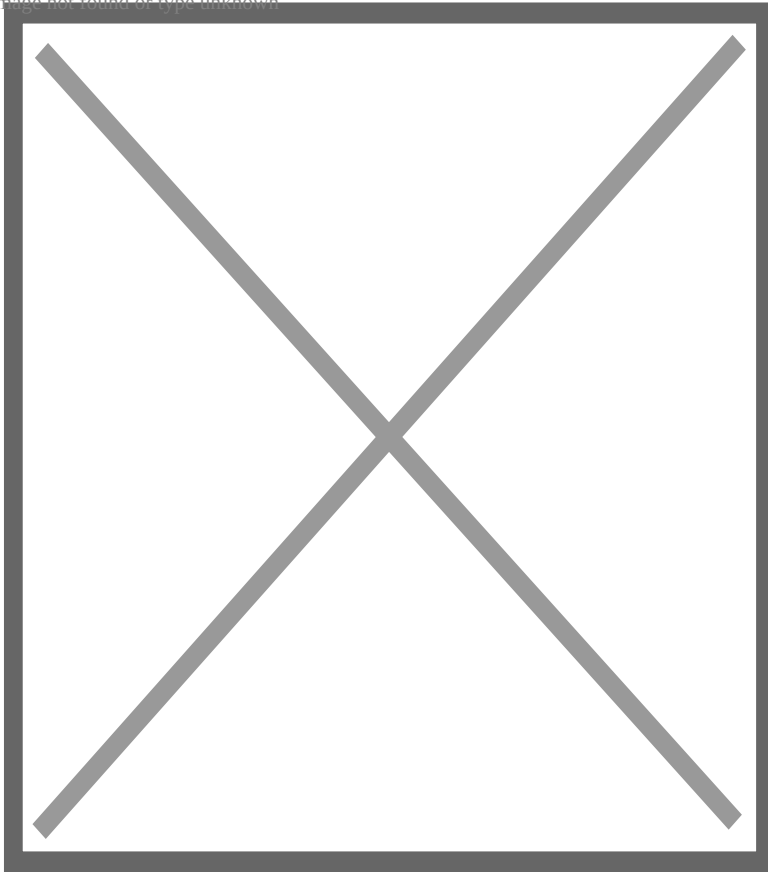
The 'dousing' claims are mostly linked to the use of glyphosate, the world's most commonly-used herbicide. Glyphosate's popularity has been driven by its toxic profile: It is by far the safest and least toxic herbicide available to farmers, and it's also inexpensive. When used on conventional crops such as wheat that are not glyphosate-resistant, the herbicide is not directly applied to the crop; when used on GMO glyphosate-resistant crops, it can be applied to the crop but only at certain stages of growth.

What about reports that North American farmers 'saturate' their crops with the herbicide glyphosate? Glyphosate use has increased dramatically over the years, driven by the fact that it has been paired with herbicide resistant biotech seeds since the mid-1990s. As Charles Benbrook, an organic industry consultant noted in [a 2012 study](#):

Overall, since the introduction of GE crops, the six major GE technologies have increased pesticide use by an estimated 183 million kgs (404 million pounds), or about 7%. The spread of [glyphosate resistant] weeds is bound to trigger further increases.... The increase in herbicides applied on [herbicide resistant] hectares has dwarfed the reduction in insecticide use over the 16 years, and will almost surely continue to do so for several more years.

Benbrook's study accurately documented the sharp increase in the use of glyphosate linked to the introduction of GMO crops in the mid-1990s. It was [criticized](#) by mainstream scientists because he ignored key facts about overall pesticide trends: chemical usage has not risen in recent decades, less chemicals are being used per acre and the toxic content of agricultural chemicals has fallen considerably.

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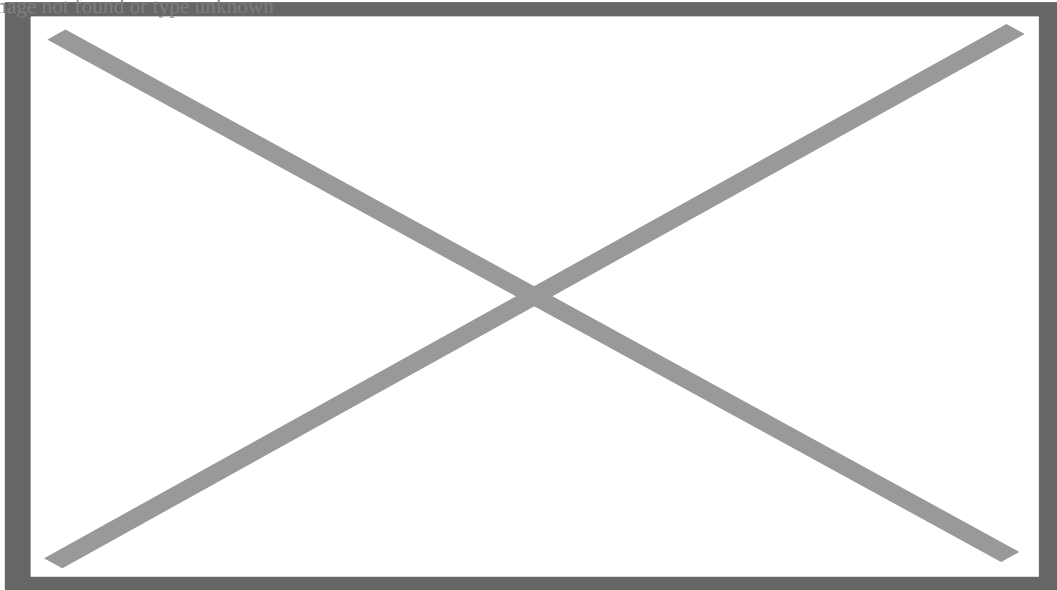
A [separate study](#) published in 2016 by four economists compounded some of the dousing misconceptions fanned by Benbrook's selective presentation. The researchers found that farmers who grew GM soybeans from 1998-2011 used 28% more herbicides than farmers who grew non-GMO soybeans, a fact one of the study's authors attributed to the proliferation of weeds resistant to glyphosate. That study was immediately picked up by organic industry critics of GMOs, which flooded the Internet with stories claiming biotech crops have led to a 'dramatic increase' in herbicide use.

GMO critics ignored much of the other data in that study, which sought to judge the "environmental impact" of herbicide use. When the researchers applied an environmental impact algorithm (EIQ), a [formula](#) developed at Cornell University that accounts for farm worker hazard, toxicity and environmental harm, the 28% rise disappeared. Here are more of the study's nuanced findings:

- Zero difference in herbicide use between glyphosate-tolerant and non-tolerant soybeans
- 9.8 reduction in corn herbicides for glyphosate-tolerant corn versus non-tolerant varieties
- 10.4% reduction in corn insecticides for insect-resistant Bt corn
- 2 % less herbicide used by adopters of field and sweet corn designed to be resistant to glyphosate versus non-adopters
- 2% reduction in the use of insecticides by growers of corn engineered to be resistant to the European corn borer, a common agricultural pest

Overall use of farm chemicals has decreased since its peak in the early 1980s, and has showed no increase since the introduction of GMO crops in the 1990s.

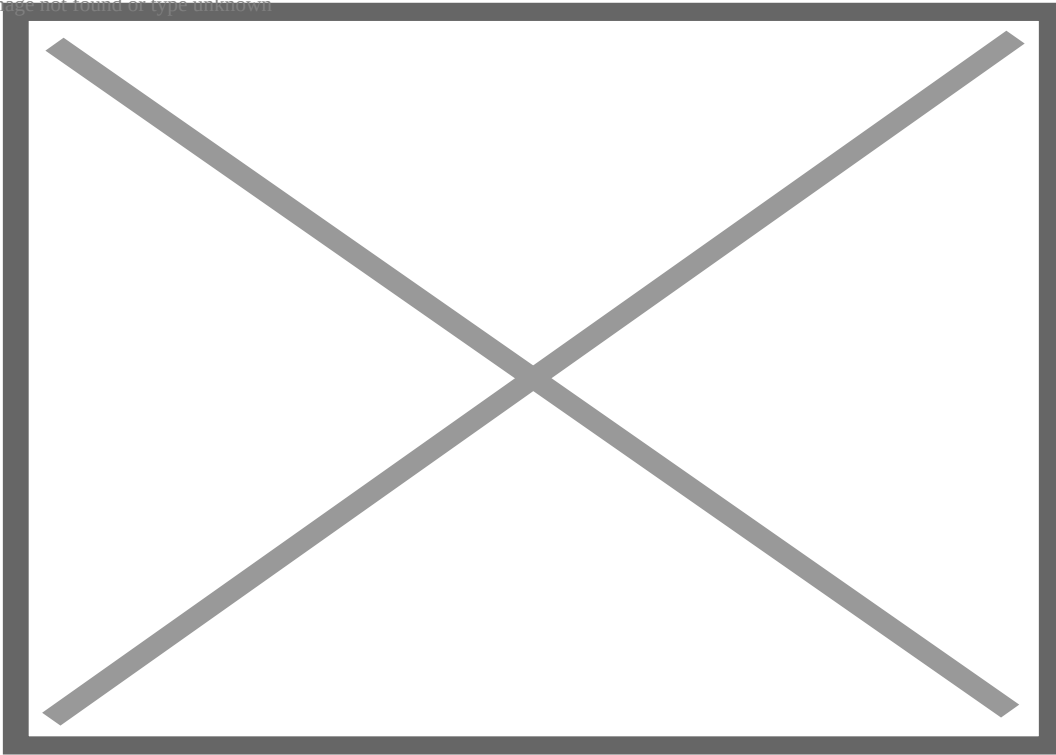
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While overall volume of chemical usage has held steady over the past 35 years, the toxicity and most importantly the persistence of the most toxic chemicals has dropped significantly, driven mostly by the introduction of low-toxicity glyphosate.

Although glyphosate accounts for one quarter of herbicides applied by weight to corn, it only accounts for [one tenth of one percent](#) of the chronic toxicity hazard associated with weed control in corn. Put another way: The other 74% of herbicides accounted for 99.9% of chronic toxicity hazard in weed control for corn. Or to put it yet another way, taking glyphosate out of the picture could raise the toxicity hazard in corn by 26%, 43% in soybeans, and 45% in cotton.

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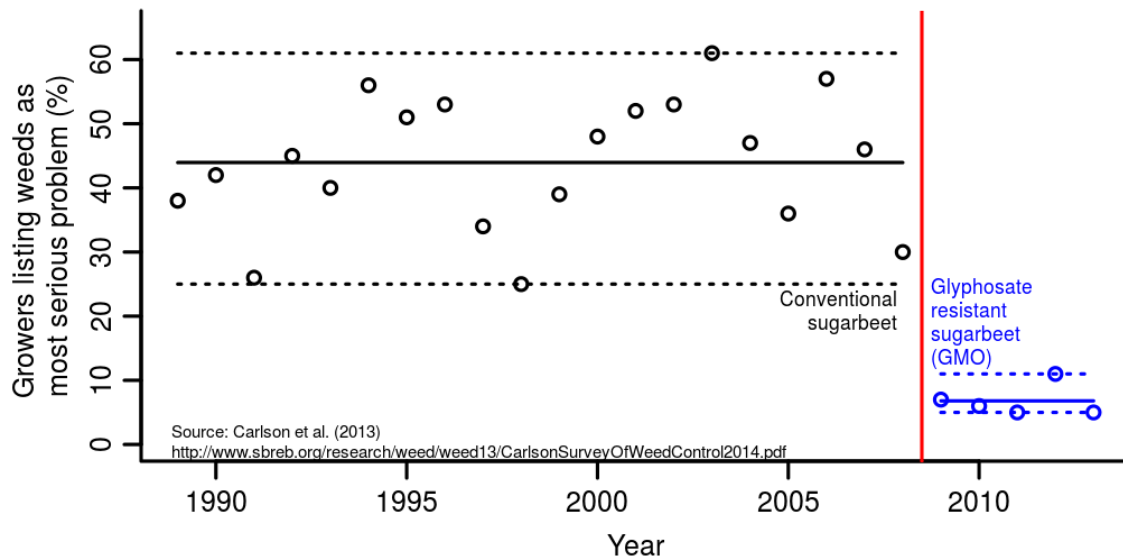
Beyond its relatively low toxicity, glyphosate use promotes sustainable farming by protecting soil health and reducing greenhouse gas emissions. Eliminating or reducing the herbicide's use in agriculture would have real environmental costs, according to University of Wyoming weed scientist [Andrew Kniss](#):

One study estimates that using glyphosate herbicide in conjunction with glyphosate-resistant corn and soybean have [prevented 41 billion lbs of CO₂](#) from being released into the atmosphere between 1996 to 2013. Adoption of glyphosate-resistant soybean was recently estimated to have [increased soil conservation tillage practices by 10, an no till adoption by 20%](#). These practices help reduce soil erosion, and the many environmental problems associated with soil erosion. Is a reduction in glyphosate worth an increase in erosion and worsening climate change?

Activists who oppose the use of glyphosate have also argued that replacing synthetic pesticides with “natural” weed control practices would improve farmer welfare. According to the activist group Pesticide Action Network (PAN), which works to “[phase out](#)” glyphosate, such a [transition would](#) “.... reduce farmers’ dependence on suppliers of costly pesticides and other external inputs.” What PAN didn’t mention is that the increase in glyphosate use was driven primarily by farmers, who were able to effectively and efficiently control weeds with the herbicide. Cutting its use would harm growers and their families. [Kniss](#):

There will be social costs to reducing glyphosate use, too. At least for some crops, farmers would have to miss more of their children’s baseball and softball games because without glyphosate, weed control can become much [more complex, labor intensive, and time consuming](#). The well-being of farmers is a [key indicator of agricultural sustainability](#)

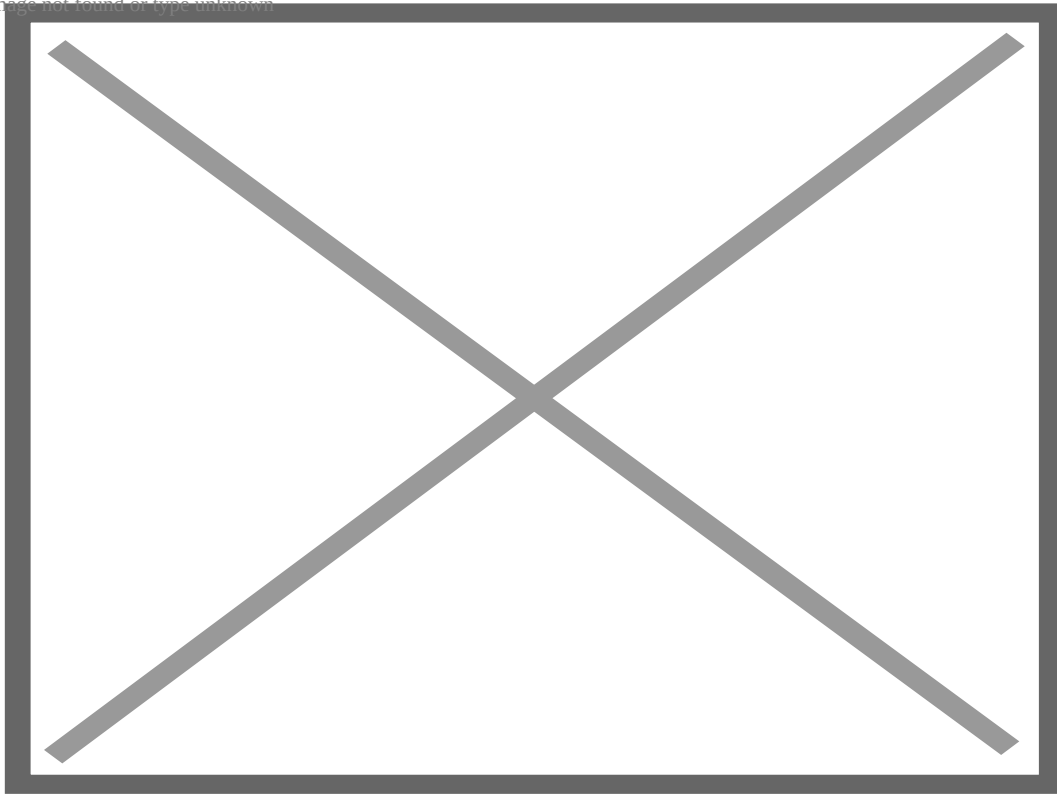
, and a major tenet of the agroecology movement. One reason many farmers have adopted this herbicide in the first place is because it has bettered their lives. Asking them to reverse those gains shouldn't be taken lightly.



The number of farmers reporting weeds as their worst production issue in the Red River Valley of North Dakota and Minnesota has dropped from as high as 60% before the adoption of glyphosate-resistant sugarbeet in 2008 to less than 10% now.

The introduction of insect-resistant crops, such as corn, soybeans, eggplant and cotton has also led to a sharp reduction in the use of insecticides— as much as 85% in the case of eggplant and corn.

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Glyphosate is most controversially used as a desiccant before each wheat harvest. Currently there are no glyphosate-tolerant varieties of wheat on the market. The chemical is used to kill weeds before the wheat begins to grow. Anti-GMO critics blame glyphosate for an increase in wheat-related ailments. The source of that claim appears to be a 2014 [blog on the website Healthy Home Economist](#) that went viral:

Standard, recommended wheat harvest protocol in the United States is to drench the wheat fields with Roundup several days before the combine harvesters work through the fields as withered, dead wheat plants are less taxing on the farm equipment and allow for an earlier and easier harvest.

Using Roundup as a desiccant on the wheat fields prior to harvest may save the farmer money and increase profits, but it is devastating to the health of the consumer who ultimately consumes those ground up wheat kernels which have absorbed a significant amount of Roundup.

According to the US Department of Agriculture, 99% of durum wheat, 97% of spring wheat, and 61% of winter wheat [in the US] has been doused with Roundup as part of the harvesting process.

As the myth-busting site [Snopes](#) and various scientists, agricultural experts and medical researchers have pointed out, these claims rest on three questionable suppositions: Gluten-linked health issues in the US are actually increasing and glyphosate is the proximate cause; those claiming sensitivities are deriving their alleged sickness solely from North American pasta and not from Italian pasta, which would require that wheat in Italy, where there are not wheat-sensitivity claims of note, contain no wheat processed in a

country where glyphosate is used in its production; and that glyphosate is 'slathered' on North American crops as a desiccant. None of those claims holds up under scrutiny.

Although there has been an increase in claims of celiac-related health issues, there has been [no increase in actual celiac-related health problems](#). There is no credible data, outside of unscientific 'correlation' charts promoted by [well-known GMO critics with no scientific credentials in this area](#) that show the increase in celiac-related claims look similar to the increase in glyphosate usage over the past 25 years (e.g. increased claims of various disorders allegedly linked to glyphosate, most notably autism, also correlate almost exactly with the increase in the consumption of organic food, as numerous critics have pointed out).

Glyphosate is, indeed, sometimes [used](#) as a desiccant, but not very extensively and not during times when it possibly could be absorbed by the emerging wheat. As the [Alberta Department of Agriculture and Forestry notes](#):

True desiccants [such as Reglone] are harvest management tools that rapidly kill above ground growth of crops and weeds, allowing for rapid dry down and an earlier harvest. Pre-harvest glyphosate application is generally used for perennial weed control. It can be used as a harvest management tool for dry down, but the effects take much longer to appear.

The oft-stated claim that 60-99% of North American wheat is slathered in glyphosate is misleading, at best. It [conflates](#) the use of glyphosate in general with the use of glyphosate as a desiccant. As Snopes notes in its analysis, "While the data on glyphosate use in pre-harvest application is either proprietary or non-existent, the [testimony of numerous farmers](#) speak to the fact that glyphosate desiccation is a rare practice in the United States, with its use generally relegated to North and South Dakota, representing about 5-10% of all winter wheat production.

"Claims of the widespread practice glyphosate desiccation of wheat in the United States are similarly without merit," Snopes concluded.