

‘Rethinking Monsanto’: Ex-GMO skeptic explains what he got wrong about Big Ag and the pitfalls of plant breeding

Beginning in 2010, I embarked on a slow-motion conversion from GMO skeptic to advocate as I began developing a more nuanced understanding of crop biotechnology and the related social issues. My transition was complete by 2013, but my thinking has continued to evolve as the technological and legal landscape surrounding plant breeding changes. In [part one](#) of this series, I discussed this evolution as it relates to GMO seed patents and biotech “moonshot” projects that could drastically change how we grow food forever.

[Editor’s note: This is part two of a two-part series. Read part one here: [What I got wrong: GMO skeptic turned crop biotech advocate explains his ‘slow-motion conversion’](#)]

Here in part two, I’ll examine how my experience with Monsanto, that incendiary brand always at the center of the GMO controversy, shifted my thinking about the company, and my biggest change of opinion so far—just how difficult it is to move plant breeding projects out of the lab and into farmers’ fields.

I share these transitions in my thinking because I hope they can help other advocates for agricultural technology refine their understanding of the same issues and improve how they communicate the significance of genetic engineering to the public.

Rethinking Monsanto

I had come to think of Monsanto (now part of Bayer) as a company with garden variety ethical issues, as the familiar criticisms turned out to be mostly false, misleading or lacking important context. From the claim that Monsanto [unjustly sued](#) farmers for saving seeds to [farmer suicides](#) in India to concerns about increased use of the [herbicide Roundup](#), none of the facts on the group seemed particularly concerning once you got the whole story.

In every high-profile case of Monsanto suing farmers, it turned out that the farmer in question knew they were violating the terms of the technology agreement covering the use of the seeds and were just trying to get something for nothing. And [when you went over the terms and the logic of the technology agreements](#), there wasn’t anything particularly onerous in them. While we saw high rates of farmers suicide, for which Monsanto was allegedly at fault, it turns out farmers were at high risk of suicide whether they grew biotech Bt (insect resistant) cotton or some other crop. Bt cotton adoption actually correlated with lower suicide rates relative to population growth, [better yields, better farmer incomes and food security](#).

The outcry over increased Roundup weedkiller use started with a true enough fact—the use of Roundup vastly increased with adoption of Roundup Ready (glyphosate-resistant) crops. But this criticism fails to take into account that Roundup displaced more toxic herbicides in the process, [significantly lowering](#) the overall toxicity load to the environment associated with weed control in the major commodity crops.

My impression of Monsanto shifted again in 2014, when the company invited me to serve as one of the

judges of its Sustainable Yield Pledge Award. That was an in-house competition among employees to judge which teams had created the best project on their own time to go above and beyond and do some good in the world. The awards were clearly an incredibly big deal inside the company, with 114 teams from around the world competing. The top projects were all rather impressive. *[Full disclosure. Monsanto paid for my travel, room and board, and provided a \$1000 stipend to cover the three days that judges spent there]*



I'm pictured above with the winning team from India, which built a giant demonstration kitchen garden that taught local kids about plants and crops, then donated prodigious amounts of food for over 150,000 students in 1,400 local schools. They also trained over 400 local farmers in modern techniques. Meanwhile, they were also working on water conservation and proper sanitation in surrounding communities. If this had been a standalone NGO, it's effort would have been damned impressive. But this was what Monsanto employees were doing instead of playing on an employee softball team.

While that was the winning project, I advocated among the other judges for a water conservation project in Peru that created an affordable low-tech system that could easily be replicated elsewhere.

During our time there, we were given tours of the science and breeding campuses, meeting Monsanto employees from all over the world. I came away with an impression of a cosmopolitan company, doing cutting-edge research with the best tools and the best scientists, and a real commitment to sustainability and genuine values of going above and beyond the bottom line. And you could feel it from the people who

worked there. Monsanto was reliably rated as one of the best companies to work for with a real commitment to diversity and LGBT rights.

And that wasn't wrong. But it turned out to be only part of the culture of the company.

Ghostwriting allegations

In 2018, during the first trial against Monsanto purporting that Roundup caused a case of non-Hodgkins lymphoma, it was revealed that the company had prepared a substantial draft of a literature review article on glyphosate that an academic scientist finished, put his name on, and published as a peer-reviewed article in an academic journal. The article is understood to be up to standard in its rigor and presents an accurate presentation of the science on glyphosate safety. While the professor in question was investigated and cleared of any ethical lapses in this 'ghostwriting' incident, it was still not a good look for Monsanto.



Credit: Yost Legal Group

I can understand why Monsanto might have initiated this misrepresentation. They had a product that was being attacked by anti-biotech and anti-industrial farming advocates as environmentally damaging and harmful to human health. The company knew the scientific literature didn't reflect those charges—a conclusion they wanted summarized and entered into the record, and no scientist had taken on the project. I empathize, but I can't condone. The company crossed an ethical line in taking an active role in shaping the scientific narrative in a behind-the-scenes manner. We need greater transparency to build trust in science and scientific institutions. The glyphosate ghostwriting episode was disappointing, if understandable.

Dicamba debacle

What really shook up my view of Monsanto was [the Dicamba Debacle](#); the company's response to the situation put a major dent in its ethical profile as far as I'm concerned. When the weed Palmer Amaranth (pigweed) began developing stubborn resistance to glyphosate throughout America's cotton and soybean belts, Monsanto developed cotton and soybean seeds that were resistant to an older herbicide called

dicamba. Because dicamba has a tendency to vaporize and drift from the field to which it was applied and damage surrounding farms and landscapes, Monsanto and other companies developed new lower-drift formulations of the weedkiller designed to stay put in the heat of Texas cotton and Arkansas soybean fields. But they didn't stay put.

The problems showed up in the fields around 2015. The new formulations didn't work as well as hoped and, under impossibly narrow conditions, drifted hither and yon, damaging neighboring farms as well as residential landscaping and local ecosystems. [Reports surfaced](#) in 2015 of Monsanto intimidating public university weed scientists into suppressing inconvenient findings and bullying elected members of the Arkansas Plant Board charged with managing risk and trade-offs in pesticide use in the state. In a recently settled court case against Monsanto and its partner in developing this product, Bayer, it was revealed that the company anticipated the problems from the start and had adopted a strategy of denying any responsibility.



North Dakota farmer Steve Miller complained about a neighbor's off-target spray damaging his fields. Credit: Forum News Service/Agweek/Mikkel Pates

While I believe the portrait of the company that I'd formed prior to the Dicamba Debacle was accurate, it's clear the company was capable of much darker actions in service to its bottom line.

Hard stuff is hard to do

Perhaps the biggest change in my thinking over the last five years has been realizing how difficult it is to move products through the pipeline, from a great idea in the laboratory to a farm-ready technology. And it's not just regulatory hurdles. It's really hard to create new, useful seed varieties for farmers, [a subject I've addressed](#)

previously.

There is no low-hanging fruit left in the field of crop breeding. At this point, every problem that breeders of any stripe are trying to tackle is a hard problem. Contemporary breeding is a long, resource-intensive process with many dead ends, whether one uses recombinant DNA (GMO) or not. Difficult challenges will sometimes lead to successful products and sometimes not.

Golden Rice, a GMO crop designed to combat Vitamin A deficiency, has been in the works for 15 years and is just now [approaching commercialization](#) in the Philippines. This is hardly an unusual time horizon for a breeding puzzle. Take, for example, Frank Kutka's nearly 15-year quest to breed conventional corn which is impervious to cross-pollination. This trait would give organic growers protection against outcrosses from GE corn. Kutka's project was routinely praised in corners where the laboriousness of getting Golden Rice to market was used as a cudgel against genetic engineering.

For the far-sighted, 15 years is just the first act. Consider The Land Institute's pursuit of perennial grains. The Land Institute is a non-profit group headed by Wes Jackson and based in Salina, Kansas. Jackson's group has now been attempting to breed viable perennial wheat for 42 years. Breeding perennials that can compete with annuals on yield and return on investment is a monumental task, and Jackson believes the project should be envisioned over a 50-75 year time horizon. Instead of being characterized as a failure of traditional breeding, Jackson's work is touted as that of a scrappy visionary.

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I first made those points five years ago, and yet I was still too optimistic about what the agricultural world would look like five years later. Most of the stuff that was in development at the time is still in development. A few things have crept into commercial use and the playing field has expanded beyond two major traits in a half dozen or so commodity crops, and within the next five years that will expand significantly.

Gene editing has already facilitated a number of new biotech products from drawing board to short order by making what was hard much easier. Non-browning potatoes, a new herbicide-tolerant canola, and more nutritious soybeans are all gene-edited products that have cleared regulatory hurdles and are already in production. Nevertheless, it remains the case that the low-hanging fruit has been picked and the hard stuff is still hard to do.

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