

Genetically Engineered Food

Failed promises and hazardous outcomes

By George Kimbrell

The following are excerpts from a talk by George Kimbrell at Beyond Pesticides' 29th National Pesticide Forum, Sustainable Community, April 8, 2011 at the Colorado School of Public Health in Denver, CO. Mr. Kimbrell is a senior attorney at the Center for Food Safety in San Francisco, CA.

Thank you all for being here. I am honored to be with you. I am an attorney, but please don't hold that against me. I'm one of the good ones. I was going to call this talk "Pesticide Promoting Crops" because actually genetically engineered (GE) crops should be called pesticide promoting crops. And if you only take one thing from my talk tonight, I hope it's that you understand that those two terms are essentially synonymous.

Pesticide Promoting Crops

If you go to Monsanto's website, they will teach you that GE foods are going to help us feed the world, have lower impacts on the environment, and increase our yields. The most recent myth is that they are going to help us solve global warming. The most basic myth is that GE is the same as conventional breeding. None of these claims are true. First of all, GE is very different than conventional breeding. Basically it's gene splicing using recombinant DNA technology. It's inserting a gene from a species that would never breed in nature into another species. So you have a flounder gene that goes into a tomato.

The most prevalent form of GE crops are Roundup Ready. They use a soil bacterium gene, which Monsanto found in the wasteland of its backyard, that was the only thing alive that could survive all the polluted chemicals and Roundup that was coming out of its factory. They took the genes from it and inserted it using a virus into plants. Low and behold, the plants became resistant to Roundup as well.

Eighty percent of GE crops are pesticide promoting. They are engineered to do one thing and one thing alone, not to increase yields, but rather to sell more pesticides. They are resistant to these pesticide companies' flagship products, primarily Roundup.

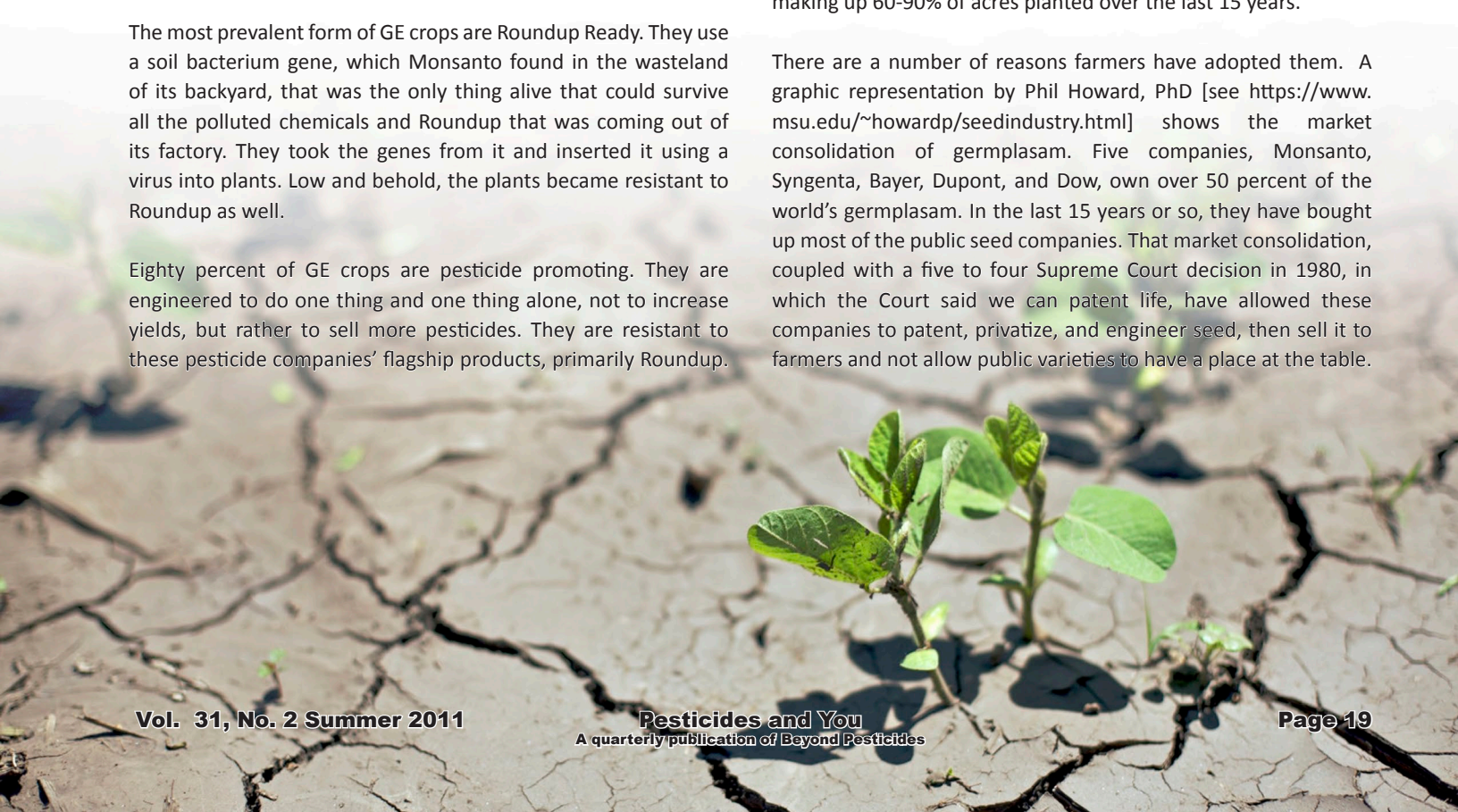
Because of GE crops, Roundup has become the most common pesticide ever. After 15 years of promises, this is what we have: herbicide tolerant corn, cotton, soy, and canola.

There have been a number of studies that have shown that overall the adoption of these crops have led to widespread impacts on our environment. The work of Charles Benbrook, PhD of the Organic Center shows an increase of 386 million pounds of pesticide use between 1998 and 2008, following the introduction of GE crops. The Union of Concerned Scientist study, *Failure to Yield*, demonstrates that GE does not increase yields. Additionally, as one of the earlier panelists have noted, another major environmental impact of GE crops is that they create superweeds, a problem similar to antibiotic resistance. When farmers douse the crops in Roundup or another pesticide repeatedly, they mutate and become resistant, forcing the farmer to douse the crop in more and more toxic pesticides. We call it the pesticide treadmill. And it is the biotech industry's solution to this problem. What we have seen in these last two years are petitions for commercialization of "stacked" GE crops. Stacked crops include Roundup resistance, as well as a 2,4-D or dicamba resistance.

The American Experiment

In 2009, the *Wall Street Journal* reported 158.1 million acres of GE crops planted in the U.S., along with 52.9 million in Brazil and 52.6 million in Argentina—very little elsewhere. Herbicide-tolerant corn, cotton and soybeans have increased dramatically, now making up 60-90% of acres planted over the last 15 years.

There are a number of reasons farmers have adopted them. A graphic representation by Phil Howard, PhD [see <https://www.msu.edu/~howardp/seedindustry.html>] shows the market consolidation of germplasm. Five companies, Monsanto, Syngenta, Bayer, Dupont, and Dow, own over 50 percent of the world's germplasm. In the last 15 years or so, they have bought up most of the public seed companies. That market consolidation, coupled with a five to four Supreme Court decision in 1980, in which the Court said we can patent life, have allowed these companies to patent, privatize, and engineer seed, then sell it to farmers and not allow public varieties to have a place at the table.





The other way this is happening is through contamination of public varieties. Biological contamination used to be called “advantageous presence” by the U.S. Department of Agriculture (USDA). I think biological contamination is a much better term for it. Contamination is essentially the mixing of DNA where it is unknown and unwanted, in wild varieties or conventional varieties of these crops. This can happen in a number of ways – through bee pollination, weather events, seed mixing, or by other means. The most famous two contamination episodes were the StarLink episode in 2001 and, more recently in 2006, the Bayer rice contamination in which rice farmers in the Southwest were contaminated by an unapproved rice variety. We ship a lot of our rice to Japan. Opposed to GE crops, Japan closed its doors once they tested it and found it to be contaminated. That export market was lost and there has been tort litigation to the tune of one billion dollars since then. All of the early court decisions have come in favor of the farmers, which is good news.

Aside from genetic contamination, there is also contamination by herbicides. These are pesticide promoting cropping systems. It is very important that when we discuss this, we don’t just talk about the engineering itself. No one buys Roundup Ready corn if they are not going to douse it with Roundup. That’s why they pay the extra amount to get the engineered seed.

The socioeconomic harm that goes along with the environmental harm has to do with farmers’ fundamental loss of their right to sow the crop of their choice. If they want to grow a non-GE variety or an organic variety, they lose that ability if their neighbor is growing Roundup Ready varieties. The risk of contamination is too high for them to be able to do that. They lose either their organic or non-GE market. There is a burden, even if contamination doesn’t happen, on farmers in the cost of testing and protection measures –buffer zones and so forth– that stems from the risk of contamination.

The Great Unknowns

Many of the harms from GE crops are unknowns, particularly on the health side. There really have been no long-term studies. This is an ongoing experiment on all of us, our families, and the environment. The reason for that is again the patents. These companies, because they own the patent on a variety, don’t have to allow academic researchers to do any research on it. If you are an academic and you want to do research on Roundup Ready alfalfa, canola, or corn, you have to get the proprietary entity’s permission –the company’s permission– to do that research. Once you have done the research on, say, monarch butterflies or another species, if they do not like the results, they can prohibit you from publishing it. They can redact whatever you publish. A number of academics have

written to the federal agencies to this extent on a number of occasions saying, we really can’t comment on the release of this particular crop because we have no way to do unbiased research. Of course, many universities are funded by these chemical companies to boot.

There are a number of health risks: novel allergens, toxicity, antibiotic ineffectiveness, altered nutrition, immuno-suppression, general lack of long-term testing, and uncertainties. Additionally, the basic scientific principle upon which GE crops is based –one gene equals one trait– has been shown to be a fallacy. We now know through epigenetics and other means that the parts of DNA that we used to call junk DNA play a much more important role. The way genes work is very much like an ecosystem –in a very holistic fashion. Yet, we still are moving forward approving and commercializing these crops based on that theory.

Rise of the Superweeds

The USDA’s record is horrific in preventing contamination from happening, although we do not have much data on post-commercialization because the Department denied that it has any post-commercialization authority. The evidence that we do have on just the field trials is that contamination happens again and again. USDA has said to us, “Don’t worry, it’s not going to get out.” But it’s hubris. Nature finds a way, in many ways, and we have seen that time and time again. The most recent event was just last summer. Scientists drove around the Dakotas sampling canola in the wild, which, you know, grows like alfalfa. It’s ubiquitous in the American west. You’ll find it in roadside ditches, fallow fields, and so forth. They tested every canola plant they found. The majority of it was Roundup Ready. So the canola had gotten out of the fields and contaminated the wild, essentially.

I think that superweeds will be one of the biggest issues in the future with regard to GE crops because of this pesticide treadmill

effect that I mentioned. This is an epidemic. Agronomic scientists have referred to the superweeds epidemic as the worst thing to happen to U.S. agriculture since the boll weevil.

Lack of Regulation

How do we regulate these crops? Well, the short answer is we don't. Or, we don't do it very well. We have what is called the *Coordinated Framework for the Regulation of Biotechnology*, which was set up in 1986. More properly I think it would have been termed the "Uncoordinated Framework," because it has a lot of loopholes in it. Oversight is separated between several sister agencies. USDA is entrusted with oversight of the plants, the Environmental Protection Agency (EPA) with the pesticides, and the Food and Drug Administration (FDA) with the food. Of course, there are overlying statutes, like the *National Environmental Policy Act*, that some of our cases have been brought under. There were no new laws passed to address the novel harms and new risks that genetic engineering creates. We have been squeezing blood from statutory stones, so to speak, with oversight for a long time now. In general, we don't have new environmental laws we need in many areas, but the emergence of new technologies, like genetic engineering, synthetic biology, and nanotechnology, exacerbate and highlight the need for new laws and regulatory mechanisms.

With regard to human health and safety testing, the assumption is that they are the same as conventional crops. In fact, Monsanto and other companies, before they market a genetically engineered variety, don't have to even meet with the regulatory agency. FDA does no independent testing whatsoever. They have voluntary consultations. That's it. Those voluntary consultations are done behind closed doors. Whatever data Monsanto or another company gives to them, it is protected as confidential business information. We do not get to see it. FDA does no testing. They take what they've been given, ask no further questions, and approve the crop or the food.

We also do not require labeling, unlike two-thirds of the rest of the world. We are the outlier. We do not give our public the right-to-choose. At the Center for Food Safety, we think this is a vital touchstone and that running away from your product is not a very good business plan. Why not allow people to choose? I don't know. I think they recognize that they add no benefit to consumers from these crops, or to farmers for that matter, so I think they know that labeling would be the death knell for them. We did litigate that and lost 11 years ago, but I think the labeling issue is one that is out there still to be won.

USDA uses a statute called the *Plant Protection Act* that is not even taught in law schools that focus on environmental law, like Lewis

and Clark, Vermont, or here at University of Colorado-Boulder. It is a law that we use for regulating invasive species from abroad when we import products. The company will petition USDA for "deregulation," which is just another word for commercialization. And then USDA, if it finds it not to be a plant pest, will allow deregulation.

Of course, the *Organic Foods Production Act* (OFPA) prohibits GE as one of its excluded methods, one of the "Big Three" that we as a community successfully kept out of organic –sewage sludge, irradiation, and genetic engineering. I'm sure many of you remember the first draft of the organic rule did not prohibit GE and then 275,000 people wrote to USDA demanding, among other things, that genetic engineering be prohibited from organic. And the final rule did prohibit the Big Three.

GE Alfalfa Litigation

USDA first approved GE alfalfa in 2005 for commercial production. It is the first genetically engineered perennial crop. In other words, it's not an annual, it's grown three to six years. It is a hardy perennial. It grows feral like canola in the wild. Currently, only 7% of all alfalfa farmers use any pesticide at all. They use cultural practices to keep out weeds. This is not a pesticide-dependent crop. Alfalfa is the fourth most widely grown crop in our country –20 million acres. It's grown in every state in the country. So this would be a dramatic increase, switching from a non-pesticide dependent system to one that would be a pesticide-dependent and pesticide promoting system.

We brought the case on behalf of a coalition of nonprofits, including Beyond Pesticides and Sierra Club, as well as organic farmers and conventional farmers, challenging USDA approval. Monsanto, the owner of the patent on Roundup, intervened in the case, as well as Forage Genetics, a subsidiary of Land O' Lakes and Monsanto's sole licensee for Roundup Ready alfalfa. We won in the District Court. The judge said that an action the



government takes that would eliminate a farmer's choice to grow a non-GE crop or a consumer's choice to eat a non-GE food was an undesirable consequence –meaning, as a legal term of art, that it mattered, it was cognizable, and that the agency had to go back and take a look at the potential environmental impacts of this crop. Under the *National Environmental Policy Act*, the court ordered that the agency undertake the most rigorous review that they can take, which is called an environmental impact statement (EIS). Remarkably, in 15 years of approving these crops, USDA had never once done an EIS on any genetically engineered crop.

In fact, their view under the Bush administration was that contamination didn't matter, and so we didn't have standing to be in court. They believed that Roundup Ready alfalfa was the same, if not better, as regular alfalfa, conventional or organic. We are in the District Court and the judge questions the government counsel and says, "And so what happens if the bees move the pollen and all the organic alfalfa goes away and all the alfalfa becomes Roundup Ready variety?" The attorney for the government said, "Well, your honor, that would be fine because it's just the same as a conventional variety except it's resistant to this herbicide, so it's better." And the judge responds, "So you mean like it's a super alfalfa?" And the attorney goes, "Well, yeah, I guess so." And then he goes, "So you mean it's like an uber alfalfa?" And then I thought, "Oh, we got him now. He gets it." And he did. We won. So he ordered them to go back and take this long review, as I said, called an EIS. In the meantime, he halted the planting and the sale of this crop. Monsanto, of course, was not exactly happy about this, and so they appealed the decision to the U.S. Court of Appeals, the Ninth Circuit, that twice affirmed, once in 2008 and once in 2009.

On to the Supreme Court

The second time that the Ninth Circuit affirmed we were pretty pleased. We figured that was the end of the case because the U.S. Supreme Court was the only thing left then and they only took 80

or so cases a year. They take requests, which are called petitions for *certiorari*. They get about 8,000 of those a year, so there's less than a 1% chance that they would take the case, even if Monsanto asked them to take it. I was feeling pretty happy about this. Again, we'd won twice, and a reporter called and asked, "What do you think the chances are that the Supreme Court will take the case?" And I said, "Slim to none and slim just left town." So after the Supreme Court took the case, my boss said, "Okay George, that phrase is retired. You can't say that anymore."

Anyway, lo and behold, the Supreme Court did take the case. It was the first they ever heard on genetically engineered crops. That happened in January 2010. So from around December of that year previous until about June, I just basically lived, breathed, slept, and ate this case for that six months. It was an intense experience. It didn't look good for us. Our best justice, Stephen Breyer, recused himself, because the lower court judge, Charles Breyer, happened to be his brother and that was his normal process. Clarence Thomas, who worked for Monsanto for a while, didn't recuse himself. So we were down our best judge and they had one already. It wasn't looking good. Of course, the current Supreme Court already is a very business friendly court. And they don't take cases if they're going to affirm. They take cases when they're going to reverse.

It looked bad. Monsanto said that we didn't have standing, farmers couldn't challenge these crops, contamination didn't matter, organic didn't matter, and whatever the government said had to go. They had an argument with regard to a full blown trial hearing, called an evidentiary hearing, with cross examination – anything they could think of. We successfully dodged those bullets. They didn't rule on any of them. Instead, they issued a rather strange decision that technically reversed the lower court and left the ban on the planting of Roundup Ready alfalfa in place. This was essentially because the lower court had given us two remedies –a belt and a pair of suspenders– one called an injunction, and one called a vacatur. The Supreme Court said, "Well you don't need the injunction if you've got the vacatur," so they took away the belt and they left the suspenders. The bottom line is after their review Monsanto couldn't sell its product, no one could plant it, and our environment was safe from it as well as our plaintiffs. It was a strange decision in that they got a lot of press that day saying in the mainstream media that they had won a great victory. But, at the end of the day on the legal issues, we won the case not just in dodging a 'parade of horrors,' but in actually getting a fantastic outcome because Roundup Ready alfalfa continued to remain banned.

In addition, USDA continued to have to do this study that the court had ordered. The



court also said that we had standing and that our plaintiffs, the farmers in question, could challenge these approvals, which was just a monumental holding. It means that in the future we can bring these cases (unless they take another case and reverse themselves, which is highly unlikely) and challenge these crops as we will continue to do. It also means that this type of harm was not solely an economic harm, which was another of Monsanto's arguments. Monsanto said, "Why do you need to stop planting if it's just market damages? If it's just about money, it's not an environmental harm." The Supreme Court said, "No, what the lower court said was that it was an environmental harm and an economic harm, that this was the fundamental altering of the DNA of this crop and that the economic harms stem from that." I think that awareness through the law was a broader cultural shift in that these cases are environmental cases. So they won the day in the media, but we won the day on the law. I'll take that outcome any day.

Roundup Ready, Round Two

I wish I could say that was the end of the story, but like Paul Harvey used to say, "That's just the rest of the story." We have another case now; "Roundup Ready Alfalfa Round 2," we call it. What happens now is USDA has done their EIS: 245,000 people wrote in opposition to the commercialization, but they again approved it despite the public outcry and the acknowledged risks. On March 18, 2011, we filed a new case challenging that new approval under the same laws: NEPA, *Endangered Species Act* and the *Plant Protection Act*. It's the same plaintiff group with a few additional ones from the last case.

Another of our cases is about Roundup Ready Sugar Beets. Essentially it's a sister case to the alfalfa case with very similar harms –increased pesticide use, weed resistance and contamination of organic chard and table beets, which can cross-pollinate with sugar beets. Again, we won that case and USDA is now undertaking an EIS (the second one it has ever done) on Roundup Ready sugar beets. I wish I could say that's the end of that story, but there have been two follow up cases to that which we refer to as "Sugar Beets 2 and 3: The Return of the Beet." Essentially, before the ink was dry on our Sugar Beets 1 victory, Monsanto and USDA tried to circumvent it and that's what these two ongoing cases are about.

Frankenfish and Beyond

We filed a number of other cases, and won a number of cases on genetically engineered crops –on genetically engineered grasses, the approval on wildlife refuges, and the newest one on genetically engineered trees for biofuels across the South. We have a new form of environmental pollution here, a new form of biological pollution which is a growing area of environmental law.



A genetically engineered AquaBounty (back) and a conventional salmon (front) of the same age.

You might have heard about the first transgenic animal that's coming to market soon –the AquaBounty salmon. If approved by FDA, it would be the first genetically engineered animal for human consumption. It's engineered to grow four times as fast as conventional salmon. It has the gene of an ocean pout, a kind of eel, so it grows all throughout the year. If it gets out into nature, essentially it could cross breed with native endangered populations of salmon and could drive them to extinction.

Conclusion

Some continuing legal questions we have here are:

- Where is the liability for GE crops? One of the things we're working toward at the end of the day is to have a situation where the liability should be with the patent-holder. That would be in line with our basic common law, property law, and nuisance and trespass law. If I'm a farmer and you're a farmer and your cattle breaks out of your barn and causes a ruckus in my barn, you are liable for that. It should be the same with these crops.
- Does the public have a right-to-know? We believe that the public should have a right-to-know and a right-to-choose.
- What is the scope of the USDA's authority? Do they have the authority to regulate them?

I want to close by saying that all of the things we've talked about tonight, all of our cases, are about stopping the bleeding. I think that at the end of the day, what all of us need to be doing is shifting the consciousness. And that has to be done on the cultural level. They're both vital, and they're both important. I'm a lawyer, I litigate. They say if you're a hammer everything looks like a nail, but, you know, there are other ways to do this. I think that a paradigm shift toward a sustainable future –not a pesticide-dominant future– is the way we want to go. People may say that's naïve, and I would say that it's not nearly as naïve as believing that the current paradigm is sustainable and that we're not going to run out of time here on this planet before we destroy it. Thank you all for your good work. I am honored to be here with you.

"Problems cannot be solved at the same level of awareness that created them." –Albert Einstein