

# MONSANTO WHISTLEBLOWER: GENETICALLY ENGINEERED CROPS MAY CAUSE DISEASE

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Monsanto was quite happy to recruit young Kirk Azevedo to sell their genetically engineered cotton. Kirk had grown up on a California farm and had worked in several jobs monitoring and testing pesticides and herbicides. Kirk was bright, ambitious, handsome and idealistic—the perfect candidate to project the company’s “Save the world through genetic engineering” image.

It was that image, in fact, that convinced Kirk to take the job in 1996. “When I was contacted by the headhunter from Monsanto, I began to study the company, namely the work of their CEO, Robert Shapiro.” Kirk was thoroughly impressed with Shapiro’s promise of a golden future through genetically modified (GM) crops. “He described how we would reduce the in-process waste from manufacturing, turn our fields into factories and produce anything from lifesaving drugs to insect-resistant plants. It was fascinating to me.” Kirk thought, “Here we go. I can do something to help the world and make it a better place.”

He left his job and accepted a position at Monsanto, rising quickly to become the facilitator for GM cotton sales in California and Arizona. He would often repeat Shapiro’s vision to customers, researchers, even fellow employees. After about three months, he visited Monsanto’s St. Louis headquarters for the first time for new employee training. There too, he took the opportunity to let his colleagues know how enthusiastic he was about Monsanto’s technology that was going to reduce waste, decrease poverty and help the world. Soon after the meeting, however, his world was shaken.

“A vice president pulled me aside,” recalled Kirk. “He told me something like, ‘Wait a second. What Robert Shapiro says is one thing. But what we do is something else. We are here to make money. He is the front man who tells a story. We don’t even understand what he is saying.’”

Kirk felt let down. “I went in there with the idea of helping and healing and came out with ‘Oh, I guess it is just another profit-oriented company.’” He returned to California, still holding out hopes that the new technology could make a difference.

## **Possible Toxins in GM Plants**

Kirk was developing the market in the West for two types of GM cotton. Bt cotton was engineered with a gene from a soil bacterium, *Bacillus thuringiensis*. Organic farmers use the natural form of the bacterium as an insecticide, spraying it occasionally during times of high pest infestation. Monsanto engineers, however, isolated and then altered the gene that produces the Bt-toxin, and inserted it into the DNA of the cotton plant. Now every cell of their Bt cotton produces a toxic protein. The other variety was Roundup Ready® cotton. It contains another bacterial gene that enables the plant to survive an otherwise toxic dose of Monsanto’s Roundup® herbicide. Since the patent on Roundup’s main active ingredient, glyphosate, was due to expire in 2000, the company was planning to sell

Roundup Ready seeds that were bundled with their Roundup herbicide, effectively extending their brand's dominance in the herbicide market.

In the summer of 1997, Kirk spoke with a Monsanto scientist who was doing some tests on Roundup Ready cotton. Using a "Western blot" analysis, the scientist was able to identify different proteins by their molecular weight. He told Kirk that the GM cotton not only contained the intended protein produced by the Roundup Ready gene, but also extra proteins that were not normally produced in the plant. These unknown proteins had been created during the gene insertion process.

Gene insertion was done using a gene gun (particle bombardment). Kirk, who has an undergraduate degree in biochemistry, understood this to be "a kind of barbaric and messy method of genetic engineering, where you use a gun-like apparatus to bombard the plant tissue with genes that are wrapped around tiny gold particles." He knew that particle bombardment can cause unpredictable changes and mutations in the DNA, which might result in new types of proteins.

The scientist dismissed these newly created proteins in the cotton plant as unimportant background noise, but Kirk wasn't convinced. Proteins can have allergenic or toxic properties, but no one at Monsanto had done a safety assessment on them. "I was afraid at that time that some of these proteins may be toxic." He was particularly concerned that the rogue proteins "might possibly lead to mad cow or some other prion-type diseases."

Kirk had just been studying mad cow disease (bovine spongiform encephalopathy) and its human counterpart, Creutzfeldt-Jakob disease (CJD). These fatal diseases had been tracked to a class of proteins called prions. Short for "proteinaceous infectious particles," prions are improperly folded proteins, which cause other healthy proteins to also become misfolded. Over time, they cause holes in the brain, severe dysfunction and death. Prions survive cooking and are believed to be transmittable to humans who eat meat from infected "mad" cows. The disease may incubate undetected for about 2 to 8 years in cows and up to 30 years in humans.

When Kirk tried to share his concerns with the scientist, he realized, "He had no idea what I was talking about; he had not even heard of prions. And this was at a time when Europe had a great concern about mad cow disease and it was just before the noble prize was won by Stanley Prusiner for his discovery of prion proteins." Kirk said "These Monsanto scientists are very knowledgeable about traditional products, like chemicals, herbicides and pesticides, but they don't understand the possible harmful outcomes of genetic engineering, such as pathophysiology or prion proteins. So I am explaining to him about the potential untoward effects of these foreign proteins, but he just did not understand."

### **Endangering the Food Supply**

At this time, Roundup Ready cotton varieties were just being introduced into other regions but were still being field-tested in California. California varieties had not yet been commercialized. But Kirk came to find out that Monsanto was feeding the cotton plants used in its test plots to cattle.

"I had great issue with this," he said. "I had worked for Abbot Laboratories doing research, doing test plots using Bt sprays from bacteria. We would never take a test plot and put into the food supply, even with somewhat benign chemistries. We would always destroy the test plot material and not let anything into the food supply. Now we entered into a new era of genetic engineering. The standard

was not the same as with pesticides. It was much lower, even though it probably should have been much higher.”

Kirk complained to the Ph.D. in charge of the test plot about feeding the experimental plants to cows. He explained that unknown proteins, including prions, might even effect humans who consume the cow’s milk and meat. The scientist replied, “Well that’s what we’re doing everywhere else and that’s what we’re doing here.” He refused to destroy the plants.

Kirk got a bit frantic. He started talking to others in the company. “I approached pretty much everyone on my team in Monsanto.” He was unable to get anyone interested. In fact, he said, “Once they understood my perspective, I was somewhat ostracized. It seemed as if once I started questioning things, people wanted to keep their distance from me. I lost the cooperation with other team members. Anything that interfered with advancing the commercialization of this technology was going to be pushed aside.”

He then approached California Agriculture Commissioners. “These local Ag commissioners are traditionally responsible for test plots and to make sure test plot designs protect people and the environment.” But Kirk got nowhere. “Once again, even at the Ag commissioner level, they were dealing with a new technology that was beyond their comprehension. They did not really grasp what untoward effects might be created by the genetic engineering process itself.”

Kirk continued to try to blow the whistle on what he thought could be devastating to the health of consumers. “I spoke to many Ag commissioners. I spoke to people at the University of California. I found no one who would even get it, or even get the connection that proteins might be pathogenic, or that there might be untoward effects associated with these foreign proteins that we knew we were producing. They didn’t even want to talk about it really. You’d kind of see a blank stare when speaking to them on this level. That led me to say I am not going to be part of this company anymore. I’m not going to be part of this disaster, from a moral perspective.”

Kirk gave his two-week notice. In early January 1998, he finished his last day of work in the morning and in the afternoon started his first day at chiropractic college. He was still determined to make a positive difference for the world, but with a radically changed approach.

While in school, he continued to research prion disease and its possible connection with GM crops. What he read then and what is known now about prions has not alleviated his concerns. He says, “The protein that manifests as mad cow disease takes about five years. With humans, however, that time line is anywhere from 10-30 years. We were talking about 1997 and today is 2006. We still don’t know if there is anything going to happen to us from our being used as test subjects.”

## **Update**

It turns out that the damage done to DNA due to the process of creating a genetically modified organism is far more extensive than previously thought.[\[1\]](#) GM crops routinely create unintended proteins, alter existing protein levels or even change the components and shape of the protein that is created by the inserted gene. Kirk’s concerns about a GM crop producing a harmful misfolded protein remain well-founded, and have been echoed by scientists as one of the many possible dangers that are not being evaluated by the biotech industry’s superficial safety assessments.

GM cotton has provided ample reports of unpredicted side-effects. In April 2006, more than 70 Indian shepherds reported that 25% of their herds died within 5-7 days of continuous grazing on Bt cotton plants.[\[2\]](#) Hundreds of Indian agricultural laborers reported allergic reactions from Bt cotton. Some cotton harvesters have been hospitalized and many laborers in cotton gin factories take antihistamines each day before work.[\[3\]](#)

The cotton's agronomic performance is also erratic. When Monsanto's GM cotton varieties were first introduced in the US, tens of thousands of acres suffered deformed roots and other unexpected problems. Monsanto paid out millions in settlements.[\[4\]](#) When Bt cotton was tested in Indonesia, widespread pest infestation and drought damage forced withdrawal of the crop, despite the fact that Monsanto had been bribing at least 140 individuals for years, trying to gain approval.[\[5\]](#) In India, inconsistent performance has resulted in more than \$80 million dollars in losses in each of two states.[\[6\]](#) Thousands of indebted Bt cotton farmers have committed suicide. In Vidarbha, in north east Maharashtra, from June through August 2006, farmers committed suicide at a rate of about one every eight hours.[\[7\]](#) (The list of adverse reactions reported from other GM crops, in lab animals, livestock and humans, is considerably longer.)

Kirk's concern about GM crop test plots also continues to remain valid. The industry has been consistently inept at controlling the spread of unapproved varieties. On August 18, 2006, for example, the USDA announced that unapproved GM long grain rice, which was last field tested by Bayer CropScience in 2001, had contaminated the US rice crop[\[8\]](#) (probably for the past 5 years). Japan responded by suspending long grain rice imports and the EU will now only accept shipments that are tested and certified GM-free. Similarly, in March 2005, the US government admitted that an unapproved corn variety had escaped from Syngenta's field trials four years earlier and had contaminated US corn.[\[9\]](#) By year's end, Japan had rejected at least 14 shipments containing the illegal corn. Other field trialed crops have been mixed with commercial varieties, consumed by farmers, stolen, even given away by government agencies and universities who had accidentally mixed seed varieties.

Some contamination from field trials may last for centuries. That may be the fate of a variety of unapproved Roundup Ready grass which, according to reports made public in August 2006, had escaped into the wild from an Oregon test plot years earlier. Pollen had crossed with other varieties and wind had dispersed seeds. Scientists believe that the variety will cross pollinate with other grass varieties and may contaminate the commercial grass seed supply—70 percent of which is grown in Oregon.

Even GM crops with known poisons are being grown outdoors without adequate safeguards for health and the environment. A corn engineered to produce pharmaceutical medicines, for example, contaminated corn and soybean fields in Iowa and Nebraska in 2002.[\[10\]](#) On August 10, 2006, a federal judge ruled that the drug-producing GM crops grown in Hawaii violated both the Endangered Species Act and the National Environmental Policy Act.[\[11\]](#)

A December 29, 2005 report by the USDA office of Inspector General, blasted the agriculture department for its abysmal oversight of GM field trials, particularly for the high risk drug producing crops.[\[12\]](#) And a January 2004 report by the National Research Council also called upon the government to strengthen its oversight, but acknowledged that there is no way to guarantee that field trialed crops will not pollute the environment.[\[13\]](#)

With the US government failing to prevent GM contamination, and with state governments and agriculture commissioners unwilling to challenge the dictates of the biotech industry, some California counties decided to enact regulations of their own. California's diverse agriculture is particularly vulnerable and thousands of field trials on not-yet-approved GM crops have already taken place there. If contamination were discovered, it could easily devastate an industry. Four counties have enacted moratoria or bans on the planting of GM crops, including both approved and unapproved varieties. This follows the actions of more than 4500 jurisdictions in Europe and dozens of nations, states and regions on all continents, which have sought to restrict planting of GM crops to protect their health, environment and agriculture.

Ironically, California's assembly, which has done nothing to protect the state from possible losses due to GM crop contamination, passed a bill on August 24, 2006 that prohibits other counties and cities from creating GM free zones. The senate is expected to vote on the issue by the end of their session on August 31st. [\[Read\]](#). It is yet another example of how the biotech industry has been able to push their agenda onto US consumers, without regard to health and environmental safeguards. No doubt that their lobbyists, anxious to have this bill pass, told legislators that GM crops are needed to stop poverty and feed a hungry world.

Jeffrey Smith's forthcoming book, *Genetic Roulette*, documents more than 60 health risks of GM foods in easy-to-read two-page spreads, and demonstrates how current safety assessments are not competent to protect consumers from the dangers. His previous book, *Seeds of Deception* ([www.seedsofdeception.com](http://www.seedsofdeception.com)), is the world's bestselling book on the subject. He is available for media at [info@seedsofdeception.com](mailto:info@seedsofdeception.com). Dr. Kirk Azevedo has a chiropractic office in Cambria, California. Press may reach him at (805) 927-1055 or at [drkirk\(at\)charter.net](mailto:drkirk(at)charter.net).

Spilling the Beans is a monthly column available at [www.responsibletechnology.org](http://www.responsibletechnology.org).

### **Footnotes:**

- 1, JR Latham et al., "The Mutational Consequences of Plant Transformation," The Journal of Biomedicine and Biotechnology, Vol 2006 Article ID 25376 Pages 1-7, DOI 10.1155/JBB/2006/25376; for a more in-depth discussion, see also Allison Wilson et al., "[Genome Scrambling -Myth or Reality?](#)" Transformation-Induced Mutations in Transgenic Crop Plants, Technical Report - October 2004
- 2, [Mortality in Sheep Flocks after Grazing on Bt Cotton Fields](#) - Warangal District, Andhra Pradesh. Report of the Preliminary Assessment April 2006
- 3, *Ashish Gupta*, et. al., Impact of Bt Cotton on Farmers' Health (in Barwani and Dhar District of Madhya Pradesh), Investigation Report, Oct - Dec 2005
- 4, See for example, [Monsanto Cited In Crop Losses](#) New York Times, June 16, 1998, and [Greenpeace](#)
- 5, Antje Lorch, [Monsanto Bribes in Indonesia, Monsanto Fined For Bribing Indonesian Officials to Avoid Environmental Studies for Bt Cotton](#), ifrik 1sep2005
- 6, Bt Cotton - No Respite for Andhra Pradesh Farmers More than 400 crores' worth losses for Bt Cotton farmers in Kharif 2005 [Centre for Sustainable Agriculture](#): Press Release, March 29, 2006, see also November 14, 2005 article in regarding [Madhya Pradesh](#).
- 7, Jaideep Hardikar, [One suicide every 8 hours](#), Daily News & Analysis (India), August 26, 2006
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- 9, Jeffrey Smith, US Government and Biotech Firm Deceive Public on GM Corn Mix-up, Spilling the

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**10**, See for example, Christopher Doering, ProdiGene to spend millions on bio-corn tainting, Reuters News Service, USA: December 9, 2002

**11**, See [www.centerforfoodsafety.org](http://www.centerforfoodsafety.org)

**12**, Office of Inspector General, [USDA, Audit Report Animal and Plant Health Inspection Service Controls Over Issuance of Genetically Engineered Organism Release Permits](#), December 2005

**13**, Justin Gillis, Genetically Modified Organisms Not Easily Contained; National Research Council Panel Urges More Work to Protect Against Contamination of Food Supply, Washington Post, Jan 21, 2004

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