Monsanto: The World's Poster Child for Corporate Manipulation and Deceit

At a biotech industry conference in January 1999, a representative from Arthur Anderson, LLP explained how they had helped Monsanto design their strategic plan. First, his team asked Monsanto executives what their ideal future looked like in 15 to 20 years. The executives described a world with 100% of all commercial seeds genetically modified and patented. Anderson consultants then worked backwards from that goal, and developed the strategy and tactics to achieve it. They presented Monsanto with the steps and procedures needed to obtain a place of industry dominance in a world in which natural seeds were virtually extinct.

This was a bold new direction for Monsanto, which needed a big change to distance them from a controversial past. As a chemical company, they had polluted the landscape with some of the most poisonous substances ever produced, contaminated virtually every human and animal on earth, and got fined and convicted of deception and wrongdoing. According to a former Monsanto vice president, "We were despised by our customers."

So they redefined themselves as a "life sciences" company, and then proceeded to pollute the landscape with toxic herbicide, contaminate the gene pool for all future generations with genetically modified plants, and get fined and convicted of deception and wrongdoing. Monsanto's chief European spokesman admitted in 1999, "Everybody over here hates us." Now the rest of the world is catching on.

"Saving the World," and other lies

Monsanto public relations story about genetically modified organisms (GMOs) are largely based on five concepts.

1. GMOs are needed to feed the world.
2. GMOs have been thoroughly tested and proven safe
3. GMOs increase yield.
4. GMOs reduce the use of agricultural chemicals.
5. GMOs can be contained, and therefore coexist with non-GM crops.

All five are pure myths—blatant falsehoods about the nature and benefit of this infant technology. The experience of former Monsanto employee Kirk Azevedo helps expose the first two lies, and provides some insight into the nature of the people working at the company.

In 1996, Monsanto recruited young Kirk Azevedo to sell their genetically engineered cotton. Azevedo accepted their offer not because of the pay increase, but due to the writings of Monsanto CEO Robert Shapiro. Shapiro had painted a picture of feeding the world and cleaning up the environment with his company's new technology. When he visited Monsanto's St. Louis headquarters for new employee training, Azevedo shared his enthusiasm for Shapiro's vision during a meeting. When the session ended, a company vice president pulled him aside and set him straight. "Wait a second," he told Azevedo. "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." Azevedo realized he was working for "just another profit-oriented company," and all the glowing words about helping the planet were just a front.

A few months later he got another shock. A company scientist told him that Roundup Ready cotton plants contained new, unintended proteins that had resulted from the gene insertion process. No safety studies had been conducted on the proteins, none were planned, and the cotton plants, which were part of field trials near his home, were being fed to cattle. Azevedo "was afraid at that time that some of these proteins may be toxic."

He asked the PhD in charge of the test plot to destroy the cotton rather than feed it to cattle, arguing that until the protein had been evaluated, the cows' milk or meat could be harmful. The scientist refused. Azevedo approached everyone on his team at Monsanto to raise concerns about the unknown protein, but no one was interested. "I was somewhat ostracized," he said. "Once I started questioning things, people wanted to keep their distance from me. . . . Anything that interfered with advancing the commercialization of this technology was going to be pushed aside." Azevedo decided to leave Monsanto. He said, "I'm not going to be part of this disaster."

Monsanto's toxic past

Azevedo got a small taste of Monsanto's character. A verdict in a lawsuit a few years later made it more explicit. On February 22, 2002, Monsanto was found guilty for poisoning the town of Anniston, Alabama with their PCB factory and covering it up for decades. They were convicted of negligence, wantonness, suppression of the truth, nuisance, trespass, and outrage. According to Alabama law, to be guilty of outrage typically requires conduct "so outrageous in character and extreme in degree as to go beyond all possible bounds of decency so as to be regarded as atrocious and utterly intolerable in civilized society."[1]

The $700 million fine imposed on Monsanto was on behalf of the Anniston residents, whose blood levels of Monsanto's toxic PCBs were hundreds or thousands of times the average. This disease-producing chemical, used as coolants and lubricants for over 50 years, are now virtually omnipresent in the blood and tissues of humans and wildlife around the globe. Ken Cook of the Environmental Working Group says that based on Monsanto documents made public during a trial, the company "knew the truth from the very beginning. They lied about it. They hid the truth from their neighbors." One Monsanto memo explains their justification: "We can't afford to lose one dollar of business." Welcome to the world of Monsanto.

Infiltrating the minds and offices of the government

To get their genetically modified products approved, Monsanto has coerced, infiltrated, and paid off government officials around the globe. In Indonesia, Monsanto gave bribes and questionable payments to at least 140 officials, attempting to get their genetically modified (GM) cotton accepted.[2] In 1998, six Canadian government scientists testified before the Senate that they were being pressured by superiors to approve rbGH, that documents were stolen from a locked file cabinet in a government office, and that Monsanto offered them a bribe of $1-2 million to pass the drug without further tests. In India, one official tampered with the report on Bt cotton to increase the yield figures to favor Monsanto.[3] And Monsanto seems to have planted their own people in key government positions in India, Brazil, Europe, and worldwide.

Monsanto's GM seeds were also illegally smuggled into countries like Brazil and Paraguay, before GMOs were approved. Roberto Franco, Paraguay's Deputy Agriculture Ministry, tactfully admits, "It is possible that [Monsanto], let's say, promoted its varieties and its seeds" before they were approved. "We had to authorize GMO seeds because they had already entered our country in an, let's say, unorthodox way."

In the US, Monsanto's people regularly infiltrate upper echelons of government, and the company offers prominent positions to officials when they leave public service. This revolving door has included key people in the White House, regulatory agencies, even the Supreme Court. Monsanto also had George Bush Senior on their side, as evidenced by footage of Vice President Bush at Monsanto's facility offering help to get their products through government bureaucracy. He says, "Call me. We're in the 'de-reg' business. Maybe we can help."

Monsanto's influence continued into the Clinton administration. Dan Glickman, then Secretary of Agriculture, says, "there was a general feeling in agro-business and inside our government in the US that if you weren't marching lock-step forward in favor of rapid approvals of biotech products, rapid approvals of GMO crops, then somehow, you were anti-science and anti-progress." Glickman summarized the mindset in the government as follows:

> **"**What I saw generically on the pro-biotech side was the attitude that the technology was good, and that it was almost immoral to say that it wasn't good, because it was going to solve the problems of the human race and feed the hungry and clothe the naked. . . . And there was a lot of money that had been invested in this, and if you're against it, you're Luddites, you're stupid. That, frankly, was the side our government was on. Without thinking, we had basically taken this issue as a trade issue and they, whoever 'they' were, wanted to keep our product out of their market. And they were foolish, or stupid, and didn't have an effective regulatory system. There was rhetoric like that even here in this department. You felt like you were almost an alien, disloyal, by trying to present an open-minded view on some of the issues being raised. So I pretty much spouted the rhetoric that everybody else around here spouted; it was written into my speeches."[4]

He admits, "when I opened my mouth in the Clinton Administration [about the lax regulations on GMOs], I got slapped around a little bit."

Hijacking the FDA to promote GMOs

In the US, new food additives must undergo extensive testing, including long-term animal feeding studies.[5] There is an exception, however, for substances that are deemed "generally recognized as safe" (GRAS). GRAS status allows a product to be commercialized without any additional testing. According to US law, to be considered GRAS the substance must be the subject of a substantial amount of peer-reviewed published studies (or equivalent) and there must be overwhelming consensus among the scientific community that the product is safe. GM foods had neither. Nonetheless, in a precedent-setting move that some experts contend was illegal, in 1992 the FDA declared that GM crops are GRAS as long as their producers say they are. Thus, the FDA does not require *any* safety evaluations or labels whatsoever. A company can even introduce a GM food to the market without telling the agency.

Such a lenient approach to GM crops was largely the result of Monsanto's legendary influence over the US government. According to the *New York Times*, "What Monsanto wished for from Washington, Monsanto and, by extension, the biotechnology industry got. . . . When the company abruptly decided that it needed to throw off the regulations and speed its foods to market, the White House quickly ushered through an unusually generous policy of self-policing." According to Dr. Henry Miller, who had a leading role in biotechnology issues at the FDA from 1979 to 1994, "In this area, the U.S. government agencies have done exactly what big agribusiness has asked them to do and told them to do."

The person who oversaw the development of the FDA's GMO policy was their Deputy Commissioner for Policy, Michael Taylor, whose position had been created especially for him in 1991. Prior to that, Taylor was an outside attorney for both Monsanto and the Food Biotechnology Council. After working at the FDA, he became Monsanto's vice president. He's now back at the FDA, as the US food safety czar.

Covering up health dangers

The policy Taylor oversaw in 1992 needed to create the impression that unintended effects from GM crops were not an issue. Otherwise their GRAS status would be undermined. But internal memos made public from a lawsuit showed that the overwhelming consensus among the agency scientists was that GM crops can have unpredictable, hard-to-detect side effects. Various departments and experts spelled these out in detail, listing allergies, toxins, nutritional effects, and new diseases as potential problems. They had urged superiors to require long-term safety studies.[6] In spite of the warnings, according to public interest attorney Steven Druker who studied the FDA's internal files, "References to the unintended negative effects of bioengineering were progressively deleted from drafts of the policy statement (over the protests of agency scientists)."[7]

FDA microbiologist Louis Pribyl wrote about the policy, "What has happened to the scientific elements of this document? Without a sound scientific base to rest on, this becomes a broad, general, 'What do I have to do to avoid trouble'-type document. . . . It will look like and probably be just a political document. . . . It reads very pro-industry, especially in the area of unintended effects."[8]

The FDA scientists' concerns were not only ignored, their very existence was denied. Consider the private memo summarizing opinions at the FDA, which stated, "The processes of genetic engineering and traditional breeding are different and according to the technical experts in the agency, they lead to different risks."[9] Contrast that with the official policy statement issued by Taylor, Monsanto's former attorney: "The agency is not aware of any information showing that foods derived by these new methods differ from other foods in any meaningful or uniform way."[10] On the basis of this false statement, the FDA does not require GM food safety testing.

Fake safety assessments

Monsanto participates in a *voluntary* consultation process with the FDA that is derided by critics as a meaningless exercise. Monsanto submits whatever information it chooses, and the FDA does not conduct or commission any studies of its own. Former EPA scientist

Doug Gurian-Sherman, who analyzed FDA review records obtained through the Freedom of Information Act, says the FDA consultation process "misses obvious errors in company-submitted data summaries, provides insufficient testing guidance, and does not require sufficiently detailed data to enable the FDA to assure that GE crops are safe to eat."[11]

But that is not the point of the exercise. The FDA doesn't actually approve the crops or declare them safe. That is Monsanto's job! At the end of the consultation, the FDA issues a letter stating:

> "Based on the safety and nutritional assessment you have conducted, it is our understanding that Monsanto has concluded that corn products derived from this new variety are not materially different in composition, safety, and other relevant parameters from corn currently on the market, and that the genetically modified corn does not raise issues that would require premarket review or approval by FDA. . . . As you are aware, it is Monsanto's responsibility to ensure that foods marketed by the firm are safe, wholesome and in compliance with all applicable legal and regulatory requirements."[12]

The National Academy of Sciences and even the pro-GM Royal Society of London[13] describe the US system as inadequate and flawed. The editor of the prestigious journal *Lancet* said**,** "It is astounding that the US Food and Drug Administration has not changed their stance on genetically modified food adopted in 1992. . . . Governments should never have allowed these products into the food chain without insisting on rigorous testing for effects on health."[14]

One obvious reason for the inflexibility of the FDA is that they are *officially* charged with both regulating biotech products and promoting them—a clear conflict. That is also why the FDA does not require mandatory labeling of GM foods. They ignore the desires of 90% of American citizens in order to support the economic interests of Monsanto and the four other GM food companies.

Monsanto's studies are secret, inadequate, and flawed

The unpublished industry studies submitted to regulators are typically kept secret based on the claim that it is "confidential business information." The Royal Society of Canada is one of many organizations that condemn this practice. Their Expert Panel called for "completely transparent" submissions, "open to full review by scientific peers" They wrote, "Peer review and independent corroboration of research findings are axioms of the scientific method, and part of the very meaning of the objectivity and neutrality of science."[15]

Whenever Monsanto's private submissions *are* made public through lawsuits or Freedom of Information Act Requests, it becomes clear why they benefit from secrecy. The quality of their research is often miserable, and would never stand up to peer-review. In December 2009, for example, a team of independent researchers published a study analyzing the raw data from three Monsanto rat studies. When they used proper statistical methods, they found that the three varieties of GM corn caused toxicity in the liver and kidneys, as well as significant changes in other organs.[16] Monsanto's studies, of course,

had claimed that the research showed no problems. The regulators had believed Monsanto, and the corn is already in our food supply.

Monsanto rigs research to miss dangers[17]

Monsanto has plenty of experience cooking the books of their research, hiding the hazards. They manufactured the infamous Agent Orange, for example, the cancer and birth-defect causing defoliant sprayed over Vietnam. It contaminated more than 3 million civilians and servicemen. But according to William Sanjour, who led the Toxic Waste Division of the Environmental Protection Agency, "thousands of veterans were disallowed benefits" because "Monsanto studies showed that dioxin [the main ingredient in Agent Orange] was not a human carcinogen." But his EPA colleague discovered that Monsanto had allegedly falsified the data in their studies. Sanjour says, "If they were done correctly, [the studies] would have reached just the opposite result."

Here are examples of tinkering with the truth about Monsanto's GM products:

- When dairy farmers inject cows with genetically modified bovine growth hormone (rbGH), more bovine growth hormone ends up in the milk. To allay fears, the FDA claimed that pasteurization destroys 90% of the hormone. In reality, the researchers of this drug (then owned by Monsanto) pasteurized the milk 120 times longer than normal. But they only destroyed 19%. So they spiked the milk with a huge amount of extra growth hormone and then repeated the long pasteurization. Only under these artificial conditions were they able to destroy 90%.
- To demonstrate that rbGH injections didn't interfere with cows' fertility, Monsanto appears to have secretly added cows to their study that were pregnant BEFORE injection.
- FDA Veterinarian Richard Burroughs said that Monsanto researchers dropped sick cows from studies, to make the drug appear safer.
- Richard Burroughs ordered more tests on rbGH than the industry wanted and was told by superiors he was slowing down the approval. He was fired and his tests canceled. The remaining whistle-blowers in the FDA had to write an anonymous letter to Congress, complaining of fraud and conflict of interest in the agency. They complained of one FDA scientist who arbitrarily increased the allowable levels of antibiotics in milk 100-fold, in order to facilitate the approval of rbGH. She had just become the head of an FDA department that was evaluating the research that she had recently done while an employee of Monsanto.
- Another former Monsanto scientist said that after company scientists conducted safety studies on bovine growth hormone, all three refused to drink any more milk, unless it was organic and therefore not treated with the drug. They feared the substantial increased of insulin-like growth factor 1 (IGF-1) in the drugged milk. IGF-1 is a significant risk factor for cancer.
- When independent researchers published a study in July 1999 showing that Monsanto's GM soy contains 12%-14% less cancer-fighting phytoestrogens, Monsanto responded with its own study, concluding that soy's phytoestrogen levels vary too much to even carry out a statistical analysis. Researchers failed to disclose,

however, that they had instructed the laboratory to use an obsolete method of detection—one that had been prone to highly variable results.

- To prove that GM protein breaks down quickly during simulated digestion, Monsanto uses thousands of times the amount of digestive enzymes and a much stronger acid than what the World Health Organization recommends.
- Monsanto told government regulators that the GM protein produced in their high-lysine GM corn was safe for humans, because it is also found in soil. They claimed that since people consume small residues of soil on fruits and vegetables, the protein has a safe history as part of the human diet. The *actual* amount of the GM corn protein an average US citizen would consume, however, if all their corn were Monsanto's variety, would be "about 30 billion-4 trillion times" the amount normally consumed in soil residues. For *equivalent* exposure, people would have to eat as much as 22,000 pounds of soil *every second of everyday.*
- Monsanto's high-lysine corn also had unusual levels of several nutritional components, such as protein and fiber. Instead of comparing it to normal corn, which would have revealed this significant disparity, Monsanto compared their GM corn to obscure corn varieties that were also far outside the normal range *on precisely these values*. On this basis, Monsanto could claim that there were no statistically significant differences in their GM corn content.

Methods used by Monsanto to hide problems are varied and plentiful. For example, researchers:

- Use animals with varied starting weights, to hinder the detection of food-related changes;
- Keep feeding studies short, to miss long-term impacts;
- Test Roundup Ready soybeans that have never been sprayed with Roundup—as they always are in real world conditions;
- Avoid feeding animals the GM crop, but instead give them a single dose of GM protein produced from GM bacteria;
- Use too few subjects to obtain statistical significance;
- Use poor or inappropriate statistical methods, or fail to even mention statistical methods, or include essential data; and
- Employ insensitive detection techniques—doomed to fail.

Monsanto's 1996 *Journal of Nutrition* study, which was their cornerstone article for "proving" that GM soy was safe, provides plenty of examples of masterfully rigged methods.

- Researchers tested GM soy on mature animals, not the more sensitive young ones. GMO safety expert Arpad Pusztai says the older animals "would have to be emaciated or poisoned to show anything."
- Organs were never weighed

- The GM soy was diluted up to 12 times which, according to an expert review, "would probably ensure that any possible undesirable GM effects did not occur."
- The amount of protein in the feed was "artificially too high," which would mask negative impacts of the soy.
- Samples were pooled from different locations and conditions, making it nearly impossible for compositional differences to be statistically significant.
- Data from the *only* side-by-side comparison was removed from the study and never published. When it was later recovered, it revealed that Monsanto's GM soy had significantly lower levels of important constituents (e.g. protein, a fatty acid, and phenylalanine, an essential amino acid) and that toasted GM soy meal had nearly twice the amount of a lectin—which interferes with the body's ability to assimilate nutrients. Moreover the amount of trypsin inhibitor, a known soy allergen, was as much as seven times higher in cooked GM soy compared to a cooked non-GM control. Monsanto named their study, "The composition of glyphosate-tolerant soybean seeds is equivalent to that of conventional soybeans."

A paper published in *Nutrition and Health* analyzed all peer-reviewed feeding studies on GM foods as of 2003. It came as no surprise that Monsanto's *Journal of Nutrition* study, along with the other four peer-reviewed animal feeding studies that were "performed more or less in collaboration with private companies," reported no negative effects of the GM diet. "On the other hand," they wrote, "adverse effects were reported (but not explained) in [the five] independent studies." They added, "It is remarkable that these effects have all been observed after feeding for only 10–14 days."[18]

A former Monsanto scientist recalls how colleagues were trying to rewrite a GM animal feeding study, to hide the ill-effects. But sometimes when study results are unmistakably damaging, Monsanto just plain lies. Monsanto's study on Roundup, for example, showed that 28 days after application, only 2% of their herbicide had broken down. They nonetheless advertised the weed killer as "biodegradable," "leaves the soil clean," and "respects the environment." These statements were declared false and illegal by judges in both the US and France. The company was forced to remove "biodegradable" from the label and pay a fine.

Monsanto attacks labeling, local democracy, and news coverage

- On July 3, 2003, Monsanto sued Oakhurst dairy because their labels stated, "Our Farmers' Pledge: No Artificial Growth Hormones." Oakhurst eventually settled with Monsanto, agreeing to include a sentence on their cartons saying that according to the FDA no significant difference has been shown between milk derived from rbGH-treated and non-rbGH-treated cows. The statement is not true. FDA scientists had acknowledged the increase of IGF-1, bovine growth hormone, antibiotics, and pus, in milk from treated cows. Nonetheless, the misleading sentence had been written years earlier by the FDA's deputy commissioner of policy, Michael Taylor, the one who was formerly Monsanto's outside attorney and later their vice president.
- Monsanto's public relations firm created a group called the Dairy Coalition, which pressured editors of the *USA Today, Boston Globe, New York Times* and others, to limit negative coverage of rbGH.

- A Monsanto attorney wrote a letter to Fox TV, promising dire consequences if the station aired a 4-part exposé on rbGH. The show was ultimately canceled.
- A book critical of Monsanto's GM foods was three days away from being published. A threatening letter from Monsanto's attorney forced the small publisher to cancel publication.
- 14,000 copies of *Ecologist* magazine dedicated to exposing Monsanto were shredded by the printer due to fears of a lawsuit.
- After a ballot initiative in California established Mendocino County as a GM-free zone—where planting GMOs is illegal, Monsanto and others organized to push through laws in 14 states that make it illegal for cities and counties to declare similar zones.

Monsanto's promises of riches come up short

Biotech advocates have wooed politicians, claiming that their new technology is the path to riches for their city, state, or nation. "This notion that you lure biotech to your community to save its economy is laughable," said Joseph Cortright, an Oregon economist who co-wrote a report on the subject. "This is a bad-idea virus that has swept through governors, mayors and economic development officials."[19] Indeed, *The Wall Street Journal* observed, "Not only has the biotech industry yielded negative financial returns for decades, it generally digs its hole deeper every year."[20] The Associated Press says it "remains a money-losing, niche industry."[21]

Nowhere in the biotech world is the bad-idea virus more toxic than in its application to GM plants. Not only does the technology under-deliver, it consistently burdens governments and entire sectors with losses and problems.

Under the first Bush administration, for example, the White House's elite Council on Competitiveness chose to fast track GM food in hopes that it would strengthen the economy and make American products more competitive overseas. The opposite ensued. US corn exports to Europe were virtually eliminated, down by 99.4 percent. The American Corn Growers Association (ACGA) calculated that the introduction of GM corn caused a drop in corn prices by 13 to 20%.[22] Their CEO said, "The ACGA believes an explanation is owed to the thousands of American farmers who were told to trust this technology, yet now see their prices fall to historically low levels while other countries exploit US vulnerability and pick off our export customers one by one."[23] US soy sales also plummeted due to GM content.

According to Charles Benbrook, PhD, former executive director of the National Academy of Sciences' Board on Agriculture, the closed markets and slashed prices forced the federal government to pay an additional $3 to $5 billion every year.[24] He says growers have only been kept afloat by the huge jump in subsidies.[25]

Instead of withdrawing support for failed GM crops, the US government has been convinced by Monsanto and others that the key to success is to force open foreign markets to GMOs. But many nations are also reeling under the false promise of GMOs.

Canola crashes on GM

When Canada became the only major producer to adopt GM canola in 1996, it led to a disaster. The premium-paying EU market, which took about one-third of Canada's canola exports in 1994 and one-fourth in '95, stopped all imports from Canada by 1998. The GM canola was diverted to the low-priced Chinese market. Not only did Canadian canola prices fall to a record low,[26] Canada even lost their EU honey exports due to the GM pollen contamination.

Australia benefited significantly from Canada's folly. By 2006, the EU was buying 38% of Australia's canola exports.[27] Nonetheless, Monsanto's people in Australia claimed that GM canola was the way to get *more* competitive. They told farmers that Roundup Ready canola would yield up to 30% more. But when an investigator looked at the *best* trial yields on Monsanto's website, it was 17% below the national average canola yield. When that was publicized, the figures quickly disappeared from the Monsanto's site. Two Aussie states did allow GM canola and sure enough, they are suffering from loss of foreign markets.

In Australia and elsewhere, the non-GMO farmers also suffer. Market prices drop, and farmers spend more to set up segregation systems, GMO testing, buffer zones, and separate storage and shipping channels to try to hold onto non-GMO markets. Even then, they risk contamination and lost premiums.

GM farmers don't earn or produce more

Monsanto has been quite successful in convincing farmers that GM crops are the ticket to greater yields and higher profits. You still hear that rhetoric at the United States Department of Agriculture (USDA). But a 2006 USDA report "could not find positive financial impacts in either the field-level nor the whole-farm analysis" for adoption of Bt corn and Roundup Ready soybeans. They said, "Perhaps the biggest issue raised by these results is how to explain the rapid adoption of [GM] crops when farm financial impacts appear to be mixed or even negative."[28]

Similarly, the Canadian National Farmers Union (NFU) flatly states, "The claim that GM seeds make our farms more profitable is false."[29] Net farm incomes in Canada plummeted since the introduction of GM canola, with the last five years being the worst in Canada's history.

In spite of numerous advertising claims that GM crops increase yield, the average GM crop from Monsanto *reduces* yield. This was confirmed by the most comprehensive evaluation on the subject, conducted by the Union of Concerned Scientists in 2009. Called *Failure to Yield*, the report demonstrated that in spite of years of trying, GM crops return less bushels than their non-GM counterparts. Even the 2006 USDA report stated that "currently available GM crops do not increase the yield potential of a hybrid variety. . . . In fact, yield may even decrease if the varieties used to carry the herbicide tolerant or insect-resistant genes are not the highest yielding cultivars." [30]

US farmers had expected higher yields with Roundup Ready soybeans, but independent studies confirm a yield loss of 4-11%.[31] Brazilian soybean yields are also down since Roundup Ready varieties were introduced.[32] In Canada, a study showed a 7.5% lower yield with Roundup Ready canola.[33]

The Canadian National Farmers Union (NFU) observed, "Corporate and government managers have spent millions trying to convince farmers and other citizens of the benefits of genetically-modified (GM) crops. But this huge public relations effort has failed to obscure the truth: GM crops do not deliver the promised benefits; they create numerous problems, costs, and risks. . . . It would be too generous even to call GM crops a solution in search of a problem: These crops have failed to provide significant solutions."[34]

Herbicide use rising due to GMOs

Monsanto bragged that their Roundup Ready technology would reduce herbicide, but at the same time they were building new Roundup factories to meet their anticipated increase in demand. They got it. According to USDA data, the amount of herbicide used in the US increased by 382.6 million pounds over 13 years. Monsanto's Roundup Ready soybeans accounted for 92% of the total increase. Due to the proliferation of Roundup resistant weeds, herbicide use is accelerating rapidly. From 2007 to 2008, herbicide used on GM herbicide tolerant crops skyrocketed by 31.4%.[35] Furthermore, as weeds fail to respond to Roundup, farmers also rely on more toxic pesticides such as the highly poisonous 2,4-D.

Contamination happens

In spite of Monsanto's assurances that it wouldn't be a problem, contamination has been a consistent and often overwhelming hardship for seed dealers, farmers, manufacturers, even entire food sectors. The biotech industry recommends buffer zones between fields, but these have not been competent to protect non-GM, organic, or wild plants from GMOs. A UK study showed canola cross-pollination occurring as far as 26 km away.[36]

But pollination is just one of several ways that contamination happens. There is also seed movement by weather and insects, crop mixing during harvest, transport, and storage, and very often, human error. The contamination is North America is so great, it is difficult for farmers to secure pure non-GM seed. In Canada, a study found 32 of 33 certified non-GM canola seeds were contaminated.[37] Most of the non-GM soy, corn, and canola seeds tested in the US also contained GMOs.[38]

Contamination can be very expensive. StarLink corn—unapproved for human consumption—ended up the US food supply in 2000 and resulted in an estimated price tag of $1 billion. The final cost of GM rice contamination in the US in 2006 could be even higher.

Deadly Deception in India

Monsanto ran a poster series called, "TRUE STORIES OF FARMERS WHO HAVE SOWN BT COTTON." One featured a farmer who claimed great benefits, but when investigators tracked him down, he turned out to be a cigarette salesman, not a farmer. Another poster claimed yields by the pictured farmer that were four times what he actually achieved. One poster showed a farmer standing next to a tractor, suggesting that sales of *Bt* cotton allowed him to buy it. But the farmer was never told what the photo was to be used for, and said that with the yields from *Bt*, "I would not be able to buy even two tractor tires."

In addition to posters, Monsanto's cotton marketers used dancing girls, famous Bollywood actors, even religious leaders to pitch their products. Some newspaper ads looked like a news stories and featured relatives of seed salesmen claiming to be happy with *Bt*. Sometimes free pesticides were given away with the seeds, and some farmers who helped with publicity got free seeds.

Scientists published a study claiming that Monsanto's cotton increased yields in India by 70-80%. But they used only field trial data provided to them by Monsanto. Actual yields turn out to be quite different:

- *India News*[39] reported studies showing a loss of about 18%.
- An independent study in Andhra Pradesh "done on [a] season-long basis continuously for three years in 87 villages" showed that growing Bt cotton cost 12% more, yielded 8.3% less, and the returns over three years were 60% less.[40]
- Another report identified a yield loss in the Warangal district of 30-60%. The official report, however, was tampered with. The local Deputy Director of Agriculture confirmed on Feb 1, 2005 that the yield figures had been secretly increased to 2.7 times higher than what farms reported. Once the state of Andhra Pradesh tallied all the actual yields, they demanded approximately $10 million USD from Monsanto to compensate farmers for losses. Monsanto refused.

In sharp contrast to the independent research done by agronomists, Monsanto commissioned studies to be done by *market research* agencies. One, for example, claimed 4 times the actual reduction in pesticide use, 12 times the actual yield, and 100 times the actual profit.[41]

In Andhra Pradesh, where 71% of farmers who used Bt cotton ended up with financial losses, farmers attacked the seed dealer's office and even "tied up Mahyco Monsanto representatives in their villages," until the police rescued them.[42]

In spite of great losses and unreliable yields, Monsanto has skillfully eliminated the availability of non-GM cotton seeds in many regions throughout India, forcing farmers to buy their varieties.

Farmers borrow heavily and at high interest rates to pay four times the price for the GM varieties, along with the chemicals needed to grow them. When Bt cotton performs poorly and can't even pay back the debt, desperate farmers resort to suicide, often drinking unused pesticides. In one region, more than three Bt cotton farmers take their own lives each day. The UK *Daily Mail* estimates that the total number of Bt cotton-related suicides in India is a staggering 125,000.

Doctors orders: no genetically modified food

A greater tragedy may be the harm from the dangerous GM foods produced by Monsanto. The American Academy of Environmental Medicine (AAEM) has called on all physicians to prescribe diets *without* GM foods to *all* patients.[43] They called for a moratorium on GMOs, long-term independent studies, and labeling. They stated, "Several animal studies indicate serious health risks associated with GM food," including infertility, immune problems, accelerated aging, insulin regulation, and changes in major

organs and the gastrointestinal system. **"There is more than a casual association between GM foods and adverse health effects. There is causation…"**

Former AAEM President Dr. Jennifer Armstrong says, "Physicians are probably seeing the effects in their patients, but need to know how to ask the right questions." Renowned biologist Pushpa M. Bhargava believes that GMOs are a *major* contributor to the deteriorating health in America.

Pregnant women and babies at great risk

GM foods are particularly dangerous for pregnant moms and children. After GM soy was fed to female rats, most of their babies died—compared to a 10% deaths among controls fed natural soy.[44] GM-fed babies were smaller, and possibly infertile.[45]

Testicles of rats fed GM soy changed from the normal pink to dark blue.[46] Mice fed GM soy had altered young sperm.[47] Embryos of GM soy-fed parent mice had changed DNA.[48] And mice fed GM corn had fewer, and smaller, babies.[49]

In Haryana, India, most buffalo that ate GM cottonseed had reproductive complications such as premature deliveries, abortions, and infertility; many calves died. About two dozen US farmers said thousands of pigs became sterile from certain GM corn varieties. Some had false pregnancies; others gave birth to bags of water. Cows and bulls also became infertile.[50]

In the US, incidence of low birth weight babies, infertility, and infant mortality are all escalating.

Food that produces poison

Monsanto's GM corn and cotton are engineered to produce a built-in pesticide called Bt-toxin—produced from soil bacteria *Bacillus thuringiensis*. When bugs bite the plant, poison splits open their stomach and kills them. Organic farmers and others use natural Bt bacteria spray for insect control, so Monsanto claims that Bt-toxin must be safe.

The Bt-toxin produced in GM plants, however, is thousands of times more concentrated than natural Bt spray, is designed to be *more* toxic,[51] has properties of an allergen, and cannot be washed off the plant.

Moreover, studies confirm that even the less toxic *natural* spray can be harmful. When dispersed by plane to kill gypsy moths in Washington and Vancouver, about 500 people reported allergy or flu-like symptoms.[52],[53] The same symptoms are now reported by farm workers from handling Bt cotton throughout India.[54]

GMOs provoke immune reactions

GMO safety expert Arpad Pusztai says changes in immune status are "a consistent feature of all the [animal] studies."[55] From Monsanto's own research to government funded trials, rodents fed Bt corn had significant immune reactions.[56] [57]

Soon after GM soy was introduced to the UK, soy allergies skyrocketed by 50%. Ohio allergist Dr. John Boyles says "I used to test for soy allergies all the time, but now that soy is genetically engineered, it is so dangerous that I tell people never to eat it."

GM soy and corn contain new proteins with allergenic properties,[58] and GM soy has up to seven times more of a known soy allergen.[59] Perhaps the US epidemic of food allergies and asthma is a casualty of genetic manipulation.

Animals dying in large numbers

In India, animals graze on cotton plants after harvest. But when shepherds let sheep graze on Bt cotton plants, thousands died. Investigators said preliminary evidence "strongly suggests that the sheep mortality was due to a toxin. . . . most probably Bt-toxin."[60] In one small study, all sheep fed Bt cotton plants died; those fed natural plants remained healthy.

In an Andhra Pradesh village, buffalo grazed on cotton plants for eight years without incident. On January 3rd, 2008, 13 buffalo grazed on Bt cotton plants for the first time. All died within three days.[61] Monsanto's Bt corn is also implicated in the deaths horses, water buffaloes, and chickens in The Philippines.[62]

Lab studies of GM crops by other companies also show mortalities. Twice the number of chickens fed Liberty Link corn died; 7 of 40 rats fed a GM tomato died within two weeks.[63] And a farmer in Germany says his cows died after exclusively eating Syngenta's GM corn.

GMOs remain inside of us

The only published human feeding study revealed that even after we stop eating GMOs, harmful GM proteins may be produced continuously inside of us; genes inserted into Monsanto's GM soy transfer into bacteria inside our intestines *and continue to function*.[64] If Bt genes also transfer, eating corn chips might transform our intestinal bacteria into living pesticide factories.

Hidden dangers

Biologist David Schubert of the Salk Institute says, "If there are problems [with GMOs], we will probably never know because the cause will not be traceable and many diseases take a very long time to develop." In the 9 years after GM crops were introduced in 1996, Americans with three or more chronic diseases jumped from 7% to 13%.[65] But without any human clinical trials or post marketing surveillance, we may never know if GMOs are a contributor.

Un-recallable contamination

In spite of the enormous health dangers, the environmental impacts may be worse still. That is because we don't have a technology to fully clean up the contaminated gene pool. The self-propagating genetic pollution released into the environment from Monsanto's crops can outlast the effects of climate change and nuclear waste.

Replacing Nature: "Nothing Shall Be Eaten That We Don't Own"

As Monsanto has moved forward with its master plan to replace nature, they have led the charge in buying up seed businesses and are now the world's largest. At least 200 independent seed companies have disappeared over 13 years, non-GMO seed availability is dwindling, and Monsanto is jacking up their seed prices dramatically. Corn is up more than 30%, soy nearly 25%, over 2008 prices.[66]

An Associated Press exposé[67] reveals how Monsanto's onerous contracts allowed them to manipulate, then dominate, the seed industry using unprecedented legal restrictions. One contract provision, for example, "prevented bidding wars" and "likely helped Monsanto buy 24 independent seed companies throughout the Farm Belt over the last few years: that corn seed agreement says that if a smaller company changes ownership, its inventory with Monsanto's traits 'shall be destroyed immediately.'"

With that restriction in place, the seed companies couldn't even think of selling to a company other than Monsanto. According to attorney David Boies, who represents DuPont—owner of Pioneer Seeds: "If the independent seed company is losing their license and has to destroy their seeds, they're not going to have anything, in effect, to sell," Boies said. "It requires them to destroy things—destroy things they paid for—if they go competitive. That's exactly the kind of restriction on competitive choice that the antitrust laws outlaw." Boies was a prosecutor on the antitrust case against Microsoft. He is now working with DuPont in their civil antitrust lawsuit against Monsanto.

Monsanto also has the right to cancel deals and wipe out the inventory of a business if the confidentiality clauses are violated

> "'We now believe that Monsanto has control over as much as 90 percent of (seed genetics). This level of control is almost unbelievable,' said Neil Harl, agricultural economist at Iowa State University who has studied the seed industry for decades."

Monsanto also controls and manipulates farmers through onerous contracts. Troy Roush, for example, is one of hundreds accused by Monsanto of illegally saving their seeds. The company requires farmers to sign a contract that they will not save and replant GM seeds from their harvest. That way Monsanto can sell its seeds—at a premium—each season.

Although Roush maintains his innocence, he was forced to settle with Monsanto after two and a half years of court battles. He says his "family was just destroyed [from] the stress involved." Many farmers are afraid, according to Roush, because Monsanto has "created a little industry that serves no other purpose than to wreck farmers' lives." Monsanto has collected an estimated $200 million from farmers thus far.

Roush says, "They are in the process of owning food, all food." Paraguayan farmer Jorge Galeano says, "Its objective is to control all of the world's food production." Renowned Indian physicist and community organizer Vandana Shiva says, "If they control seed, they control food; they know it, it's strategic. It's more powerful than bombs; it's more powerful than guns. This is the best way to control the populations of the world."

Our food security lies in diversity—both *bio*diversity, and diversity of owners and interests. *Any* single company that consolidates ownership of seeds, and therefore power over the food supply, is a dangerous threat. Of all the corporations in the world, however, the one we should trust the least is Monsanto. With them at the helm, the impact could be cataclysmic.

International bestselling author and independent filmmaker Jeffrey M. Smith is the Executive Director of the Institute for Responsible Technology (IRT) and the leading spokesperson on the health dangers of GMOs. His first book, *Seeds of Deception* is the world's bestselling book on the subject. His second, *Genetic Roulette*: *The Documented Health Risks of Genetically Engineered Foods*, identifies 65 risks of GMOs and demonstrates how superficial government approvals and industry research are not competent to find *most* of them. IRT's Campaign for Healthier Eating in America is designed to create a tipping point of consumer rejection of GMOs, forcing them out of the market. www.ResponsibleTechnology.org.

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