

# BioDemocracy News #37

## January 2002

### **Frankencorn Fight: Cautionary Tales**

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### [Quotes of the Month](#)

#### [Biodiversity Bombshell](#)

#### [Corn Dumping: Collateral Damage](#)

#### [Southern Corn Blight: A Cautionary Tale](#)

#### [Frankencorn: Additional Environmental Hazards](#)

#### [Frankencorn: Human Health Hazards](#)

#### [Frankencorn and Mice: Another Cautionary Tale](#)

#### [Frankencorn or Pesticides: Choose your Poison](#)

#### [Raise Hell: Not Frankencorn:](#)

### **QUOTES OF THE MONTH:**

"Corn diversity is essential to the future of our agricultural systems. Jack Harlan, the famous botanist, has noted that genetic diversity 'stands between us and catastrophic starvation on a scale we cannot imagine.'" Press Release by Greenpeace Mexico 9/1/01

"We have to get away from the romantic anachronism that developing countries should strive for self-sufficiency in food." John Block, former US Secretary of Agriculture, 1986

"For people who want to buy corn, there really isn't much choice but to come to us." Bob Kohlmeyer, Cargill Corporation, Des Moines Register 11/15/00

"We have a saying in our company. Our competitors are our friends. Our customers are the enemy." James Randall, Archer Daniels Midland Corporation, quoted in Fortune magazine 4/26/99

"Farmers don't like to hear that we're essentially a ward of the government, that we're on a workfare program," Alan Libbra, Illinois farmer, St. Louis Post-Dispatch 12/5/01

"Regardless of what the biotechnology industry wants us to believe, agricultural genetic engineering is an imprecise science. It relies on methods that include the haphazard insertion of genetic elements into

a plant's genome. This in turn may result in the disruption of complex gene interactions and may lead to potentially catastrophic results."

Dr. Michael Hansen & Ellen Hickey, Global Pesticide Campaigner, April 2000

## **BIODIVERSITY BOMBSHELL**

On September 4, 2001 Mexican officials admitted that an alarming number of genetically engineered (GE) corn plants have been detected growing alongside traditional corn varieties over a widespread area in the state of Oaxaca. For millennia corn has been sacred to the Maya and other native people of Mexico. Over centuries small farmers have carefully bred and preserved thousands of different traditional varieties of corn, called landraces, which are specific to each geographical region, soil type, and micro-climate of the country. Corn, or maize as it is called traditionally, remains today the most important crop for a quarter of the nation's 10 million indigenous and small farmers. Corn tortillas play a major role in the diet of Mexico's 100 million people. Critics have warned that GE corn should never be imported into Mexico, the most important world center of biodiversity for corn, since the gene pool of the nation's 20,000 corn varieties and plant relatives, including the progenitor species of corn, called teosinte, could be irreversibly damaged by "genetic pollution" from the genetically engineered (herbicide-resistant or Bt-spliced) maize being aggressively marketed by Monsanto, Syngenta (formerly called Novartis), and other agbiotech transnationals.

Under pressure to protect the nation's corn biodiversity, Mexican authorities have proclaimed a moratorium on domestic cultivation of GE corn. Meanwhile, they have ignored the massive dumping of millions of tons of cheap (US taxpayer-subsidized) GE corn by corporations such as Archer Daniels Midland (ADM) and Cargill. Agronomists and environmentalists fear that Mexican farmers have now, perhaps unknowingly, spread this imported Frankencorn into most of the corn-growing regions of the country, by planting GE corn from the US which was supposed to be sold for human food consumption only. Since impoverished Mexican farmers are looking for the cheapest corn seed possible to plant, they are increasingly choosing to buy the imported GE-tainted corn from the US, since it is considerably cheaper than non-subsidized Mexican varieties.

## **CORN DUMPING: COLLATERAL DAMAGE**

Compounding Mexico's genetic pollution problem is the fact that major overseas buyers of corn (Europe, Japan, Korea) are stubbornly refusing to buy gene-altered corn. Consequently North American exporters are finding it necessary to dump increasing amounts of GE-tainted maize on

captive markets such as Mexico, China, Egypt, Colombia, Malaysia, and Brazil. Nineteen percent of the US corn, 14 million acres, is now genetically engineered, although GE acreage is down 30% from two years ago, mainly due to global resistance against Frankenfoods.

Corn dumping in Mexico has accelerated since the advent of the 1994 North American Free Trade Agreement (NAFTA). Under the relentless pressure of globalization, Mexico has been transformed from being a major producer of corn (producing 98% of its needs for example in 1994) to a major importer, ranking third in the world (after Japan and Korea) in terms of imports from the US and Canada. The reason for this is simple. Corn costs essentially \$3.40 a bushel for family-sized farmers in the US and Canada to produce, and even more for a small farmer in Mexico. Yet Cargill and ADM, due to their monopoly control of the market, pay US farmers less than \$2.00 a bushel, with the US taxpayer picking up the remainder of the tab. This enormous subsidy in turn gets reimbursed to farmers, although large corporate farms get the lion's share of the US's annual \$20-30 billion in farm price support payments. Even with enormous taxpayer subsidies, most years US farmers have trouble even recuperating their costs of corn production-leading to demands by family farmers for a breakup of Cargill and ADM's grain monopoly. Only organic corn farmers, operating outside ADM and Cargill's cartel, are receiving a fair price for their harvest. And of course North American organic corn growers are increasingly alarmed over the fact that "genetic pollution" or gene flow from GE corn fields are starting to contaminate their valuable crops.

Longstanding Mexican government regulation of corn supply and prices, support for small corn growers, and price subsidies for corn tortillas for Mexican consumers have been eliminated, all at the behest of Cargill, ADM, and ADM's powerful Mexican partner, Gruma/Maseca. The end result of this globalization process is that small and medium-sized farmers, both North and South of the border, can't make a living, while ADM and Cargill (and their preferred customers such as McDonald's, Wal-Mart, Tyson, Smithfield) make a killing. Meanwhile, consumers, who have been promised that Free Trade would result in lower prices, are paying more for food every year. Corn tortillas, the main staple of the Mexican diet, have risen in price 300% since NAFTA came into effect.

### **SOUTHERN CORN BLIGHT: A CAUTIONARY TALE**

As botanists and plant breeders warn, contaminating Mexico's irreplaceable corn landraces and germplasm pool could be "catastrophic" for farmers and consumers. For example in 1970, millions of acres of the US corn crop were devastated by a Southern

corn leaf blight which destroyed 15% of the total US harvest (50% of all corn in some areas), leading to over \$1 billion in losses, not to mention marketplace shortages. By going to the "germplasm" bank of thousands of traditional varieties cultivated in Mexico, and withdrawing several varieties which were resistant to the Southern corn blight, plant breeders were able to use conventional cross-breeding and come up with a single blight-resistant hybrid variety which was planted in 1971--thereby saving billions of dollars in losses and maintaining global food security.

Underlining the central importance of corn biodiversity and preserving traditional varieties or landraces, researchers have also found in recent years that a perennial variety of corn's original parent, teosinte, found in Mexico, contains genes that can protect plants from seven of the nine principle viruses that infect corn crops in the US.

Of course if herbicide-resistant and Bt corn had already been polluting Mexico's centers of corn biodiversity before 1970, no one knows if the traditional variety resistant to Southern corn blight would still have been around to save the day. Likewise no one can predict the impact of Frankencorn pollution on virus-resistant teosinte varieties and other corn plant relatives. But one thing is certain, if globalization continues to drive several million Mexican farmers from the land, and forces traditional growers to shift to growing non-corn export crops, most of the nation's heirloom corn varieties or landraces will be lost forever, since centralized seed banks (which typically store rather than cultivate their thousands of different varieties) cannot properly preserve landraces which are no longer being cultivated in their native areas. Analysts estimate that almost a million small farmers--primary breeders and stewards of thousands of corn and other crop landraces--already have been driven from their cornfields and communal lands (ejidos) since Mexico essentially turned over control of its agricultural sector to Cargill, ADM, and other North American food giants.

Even US Environmental Protection Agency (EPA) scientists have previously warned that genetically engineered crops should not be grown where wild relatives exist (prohibiting for example GE cotton from being grown in parts of southern Florida, where wild relatives of cotton exist), much less in biological centers of diversity such as the maize-growing areas of Mexico. Of course this concern over genetic pollution didn't prevent the EPA in October 2001 from giving the green light to allow Bt corn to continue to be grown for seven more years in the US, ignoring environmental and public health concerns voiced by scientists and consumer groups--knowing full well that millions of tons of GE-tainted corn continue to be exported by US corporations to centers of corn biodiversity such as Mexico, Central America, South

America, and the Caribbean.

Genetic engineering of agricultural crops and corn dumping not only pose a serious threat to Mexico (and Central America's) corn biodiversity, but also pose a threat to continental peace and stability as well. Since NAFTA went into effect, local and regional markets for indigenous and small farmers in the region have been undermined and destroyed. Farmers are finding it increasingly difficult to sell their corn, beans, coffee, or other crops. Rural poverty and hunger have increased, forcing millions of campesinos to migrate to the US. Mounting desperation has also spawned widespread, at times violent, agrarian conflicts in Mexican states such as Chiapas, Oaxaca, and Guerrero and threatens to reignite armed struggle across Central America.

### **FRANKENCORN: ADDITIONAL ENVIRONMENTAL HAZARDS**

The threat to thousands of traditional varieties of corn in Mexico is just one of the environmental hazards of genetically engineered corn. Other environmental dangers include:

- . Bt (*Bacillus thuringiensis*)-spliced corn and crops pose a mortal threat to organic and sustainable (low-chemical input) agriculture, since they may soon destroy the effectiveness of organic farmers' most important biopesticide. In its non-GE, natural Bt spray form, *Bacillus thuringiensis* is the most important pest control agent in organic agriculture, with yearly sales in the US alone of \$60 million. This non-GE spray form of Bt is applied externally and evaporates within 2-7 days. Scientists predict that the super-potent, long lasting toxin found in Bt gene-spliced corn and other plants are likely to give rise to Superpests such as corn ear-worms which will be immune to the natural organic Bt sprays.

- . Bt-spliced crops such as corn damage the soil food web, killing beneficial soil microorganisms and reducing soil fertility. Bt corn leaches its powerful genetically engineered poison into the soil (a toxin which differs considerably from the naturally occurring Bt soil bacteria) and remains toxic up to eight months, even after being plowed under the soil.

- . Bt-spliced crops kill off natural predators and disrupt the balance among insects, leading to pest infestations.

- . Bt-spliced crops kill beneficial insects such as lacewings and ladybugs.

- . Bt-spliced crops, due to increased insect mortality, reduce the food supply for birds and other insect predators such as bats.

- . Bt-corn pollen (ingested along with other Bt-contaminated corn tissue) kills monarch butterflies and related species, such as the endangered Karner Blue butterfly.

. Herbicide-resistant GE corn, sprayed with Monsanto's Roundup Ready weed killer, kills all the foliage in and around cornfields, depriving butterflies and related insects of important food sources such as milkweed. Roundup or glyphosate residues also remain in the soil and water, killing soil microorganisms and marine life.

## **FRANKENCORN: HUMAN HEALTH HAZARDS**

Bt corn is designed to punch holes in the intestines of certain insects and kill them. But what does it do to the gut, immune system, and other vital organs of humans and animals? A good question, especially since the biotech industry, EPA, and other government officials have never bothered to look at this public health issue, despite growing concerns expressed by a broad cross-section of scientists and public interest consumer groups. Everyone by now has heard about the StarLink corn fiasco 18 months ago, when an illegal and likely allergenic variety of Bt corn contaminated 10% of the US corn crop and forced a billion dollar recall of 300 brand name products, including Kraft Taco Bell shells. But what about the other varieties of Bt corn, the stuff you're likely eating every time you bite into a corn product which is not labeled "organic?"

The Gene Giants claim that Bt corn is chemically "substantially equivalent" to conventional corn, and that eating it, therefore, will have exactly the same physiological impact as consuming regular corn. Well-respected experts such as Dr. Michael Hansen from the Consumers Union point out that this is not true. The Bt endotoxin and proteins expressed in every cell of genetically engineered corn are different from what humans and animals have ever eaten before. The haphazard insertion of a "genetic cassette" (including promoters, vectors, and antibiotic resistance marker genes) into the corn host genome is essentially random since scientists don't know if or when the foreign gene will be spliced into the plant's DNA, which of hundreds or even thousands of proteins will be expressed or generated, or even how many copies of the gene will be produced. Bt, the naturally occurring soil bacteria, is not the same as Syngenta or Monsanto's patented and gene-altered Bt forcefully injected into GE corn. Although there's a lot we don't know yet about the potential hazards of eating GE corn, in terms of toxins, allergies, and impacts on the human gut and digestive system, there are enough danger signs already to give us pause for thought. Mounting evidence includes the following:

- . Hundreds of Americans over the past year have reported allergic reactions to the FDA after eating corn products likely containing StarLink corn or other Bt varieties.
- . Scientists have pointed out that all Bt corn varieties produce proteins closely related to the suspected allergen in StarLink corn.

. Cattle and other animals have been observed on a number of farms in the Midwestern US refusing to eat genetically engineered corn, while simultaneously munching conventional corn, along with the entire cornstalk, right down to the ground.

. In a well-funded and carefully-designed experiment carried out by Dr. Arpad Pusztai in the UK in 1995-99, rats fed lectin-spliced potatoes (Bt is a member of the lectin family) suffered significant damage to their gut, immune system, and other vital organs. Pusztai later warned--after he was abruptly fired and his lab was shut down--that all gene-spliced lectins, including Bt crops, should be carefully investigated for possible adverse human health impacts.

. Gene-altered antibiotic resistant marker (ARM) genes, similar to those contained in Bt corn, have been found in the guts of bees which had consumed the pollen from GE plants. Sophisticated studies in the Netherlands and Britain have indicated that ARM genes can likely combine with bacteria already present in the human throat, mouth, and gut. These "armed genes" can then give rise to new virulent, antibiotic-resistant strains of bacteria, exacerbating the already serious problem of antibiotic resistant pathogens such as salmonella, now routinely found in non-organic meat and other animal products. The British Medical Association and the World Health Organization have recommended that the use of antibiotic resistance genes in GE corn and other food crops be eliminated.

### **FRANKENCORN AND MICE: ANOTHER CAUTIONARY TALE**

Concerned that industry and government have failed to carry out proper scientific studies on the safety of GE corn and other Frankenfoods, a young Dutch science student, Hinze Hogendoorn, recently decided to take matters into his own hands. Dr. Mae Wan-Ho, a British geneticist and world renowned critic of biotechnology, reported the results of this simple, yet remarkable animal-feeding experiment on her website [www.i-sis.org](http://www.i-sis.org) in December 2001. Here are excerpts from Dr. Ho's report:

"A Dutch farmer left two piles of maize in a barn infested with mice, one pile GM (genetically modified), the other non-GM. The GM pile was untouched, while the non-GM pile was completely eaten up. Incredible! Young undergraduate Hinze Hogendoorn, from University College, Utrecht devised his own laboratory tests and confirmed the finding, and more. An activist group (Jongeren Milieu Aktief) presented the report Hinze has written to the Dutch parliament on December 11, 2001 and is featuring it on their new website ([www.talk2000.nl](http://www.talk2000.nl)).

Hinze couldn't find a single scientific report on animals being tested for preference of GM versus non GM food on the web when he began. On extending his search to effects of GM foods on animals, he came across

reports from companies developing GM foods, all declaring there were no adverse impacts. But he also came across independent researchers who have reported harmful effects, including Dr. Arpad Pusztai, who found GM potatoes damaged the kidney, thymus, spleen and gut of young rats.

[Hinze] was stumped at first, because he would have needed to go through a lot of bureaucracy to experiment on animals. However, he managed to rescue 30 female six-week old mice bred to feed snakes from a herpetology centre. [Hinze gave] them a staple food along with the two foods [GM and non-GE corn and soya] that were to be compared, so they could really show their preference without being starved.

Large cages were used so the mice had plenty of room to move around. At the beginning, all the mice were weighed before they were put into the cage[s]. The mice had not eaten for some time, but amazingly, they [immediately] showed very definite food preferences [preferring the non GM corn and soya]. For the next [nine] week[s], Hinze continued to give the mice GM and non GM maize or soya chunks. the mice consumed 61% non GM and 39% GM food when given free choice.

For the next experiment, Hinze tested for the [health] effects of GM food. Over the next 10 days, he kept track of the amount of food that the two groups consumed each day, and weighed the mice, halfway through and at the end of the experiments.

The group fed GM ate more, probably because they were slightly heavier on average to begin with, but they gained less weight. By the end, they actually lost weight. In contrast, the group fed non GM ate less and gained more weight, continuing to gain weight until the end of the experiment. The results were statistically significant.

That was not the only difference observed. There were marked behavioral differences. The mice fed GM food "seemed less active while in their cages."

The most striking difference was when the mice were weighed at the end of the experiment. The mice fed GM food were "more distressed" than the other mice. "Many were running round and round the basket, scrabbling desperately in the sawdust, and even frantically jumping up the sides, something I'd never seen before." They were clearly more nervous than the mice from the other cage. "For me this was the most disconcerting evidence that GM food is not quite normal."

Another "interesting result" is that one of the mice in the GM cage was found dead at the end of the experiment. Hinze concluded, "At the end of everything, I must admit that the experiment has done nothing to soothe my qualms concerning genetically enhanced food."

## **FRANKENCORN OR PESTICIDES: CHOOSE YOUR POISON**

The hazards of genetically engineered corn, and other GE foods, are frightening. But even if global resistance were able to drive GE corn off the market tomorrow, we would still be left with a highly toxic, chemical-intensive, industrial-style system of corn production which is depleting soil fertility, poisoning municipal water supplies, and quickly turning indigenous people and family farmers into an endangered species. Even without Frankencrops, we would still be facing an out-of-control globalization process, which is driving millions of farmers off the land and forcing desperate peasants to chop down remaining forests--in the process driving hundreds of thousands of landraces and traditional varieties of plants, microorganisms, (and animals) into extinction.

Syngenta's conventional (non-GE) corn and pesticides are just as scary as their Frankencorn. Syngenta profits by selling corn farmers either gene-altered Bt corn or its conventional (fertilizer and pesticide-intensive) hybrids, along with its super toxic weed killer, Atrazine, a known carcinogen. Unfortunately Atrazine not only kills weeds, but also ends up as a dangerous residue in the meat and dairy products of animals that have eaten Atrazine-sprayed corn. Atrazine, along with its companion pesticides, have also polluted wells and drinking water in 97% of the communities in the US Corn Belt. What's more dangerous, eating Bt corn, consuming pesticide residues in your Big Mac or non-organic dairy products, or drinking the tap water that comes out of your faucet?

Similarly, Monsanto is in the business of selling toxic pesticides and herbicides, whether it is to farmers growing GE crops, farmers growing non-GE hybrid crops, Roundup-spraying drug warriors in Colombia or California, or suburbanites trying to get that perfectly green lawn. After 100 years of poisoning the public with substances like PCBs and Agent Orange, Monsanto tells us that their latest toxic chemicals such as Roundup, or their latest seed varieties, such as Roundup Ready corn are perfectly safe. Should we believe them? Or what about Cargill? They're happy to sell their chemical nitrate fertilizers (which also end up in most Americans' drinking water) to farmers, whether they are planting GE Frankencrops or just conventional industrial hybrids. Or ADM, who are happy to sell you either GE corn or non-GE corn, as long as they can drive the prices down which they pay to farmers, and drive the prices up to their "enemy," the consumer.

The solution of course to all this is to buy and eat organic food, and to buy from local and regional farmers and companies, rather than the transnational corporations whenever possible. Mexicans can protect their health and preserve their biodiversity by boycotting gringo

GE-tainted corn and buying organic corn produced by Mexican farmers cultivating traditional varieties. US consumers similarly can protect their health, their drinking water, and their children by buying organic and local. Fortunately this is what more and more people are doing everyday, not only in the USA but across the world. Farmers in 130 nations are now producing certified organic food for a booming market of organic consumers, making organic the fastest growing component of world agriculture. Thirty million Americans are now buying organic food and the numbers are rising every month. Since September 11, sales of organic and natural food have increased 8%.

## **RAISE HELL NOT FRANKENCORN**

Beyond voting with our consumer dollars and our knives and forks for a sustainable and organic future, organic consumers also need to organize ourselves into a potent political force. As the labor populist Mother Jones told rural Americans 100 years ago: "It's time to raise less corn and raise more hell." Instead of letting the politicians raise our taxes in order to subsidize the profits of the Gene Giants and corporate agribusiness, we should be raising hell in Washington and in our state capitals to raise corporate taxes to subsidize healthy food and a healthy environment. Instead of subsidizing GE corn, pesticide-intensive corn, and industrial-sized farms, our billions of dollars in farm subsidies should be promoting organic agriculture, saving family farms, and promoting Fair Trade, not Free Trade, among nations.

The OCA, is organizing, along with our allies in the Genetically Engineered Food Alert <[www.gefoodalert.org](http://www.gefoodalert.org)> a national day of protest against genetically engineered corn on February 6. We will be targeting the largest food corporation in the US, Kraft/Phillip Morris, as well as other companies and supermarket chains to remove GE corn from US consumer products. On this day we will also be telling the government to take Bt corn off the market, unless it can be proven safe for human consumption and the environment (which of course it cannot). At the same time we are calling on grain exporters and the US government to protect corn biodiversity and to honor the global treaty on Biodiversity (the Biosafety Protocol signed in Cartagena, Colombia, Feb. 2000) by ending the dumping of taxpayer subsidized GE corn in Mexico and other nations.

We need your help to pressure Kraft and to leaflet major supermarket chains on Feb. 6. We need to tell America's food giants to stop selling Bt corn and other unlabeled and untested Frankenfoods. If you are willing to help leaflet in your community, please send an email to [simon@organicconsumers.org](mailto:simon@organicconsumers.org)  
To send an email to Kraft click [here](#)

<http://www.gefoodalert.org/takeaction/>

Stay tuned to BioDemocracy News and our website [www.organicconsumers.org](http://www.organicconsumers.org) for the latest news and developments. We have thousands of articles posted on our website (and a convenient Search Engine to find them) which deal with GE food, Mad Cow, food irradiation, industrial agriculture, food safety, organic food, and globalization. On our website you'll also find the latest information and Action Alerts on current OCA campaigns, such as the Starbucks campaign. Check us out.

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