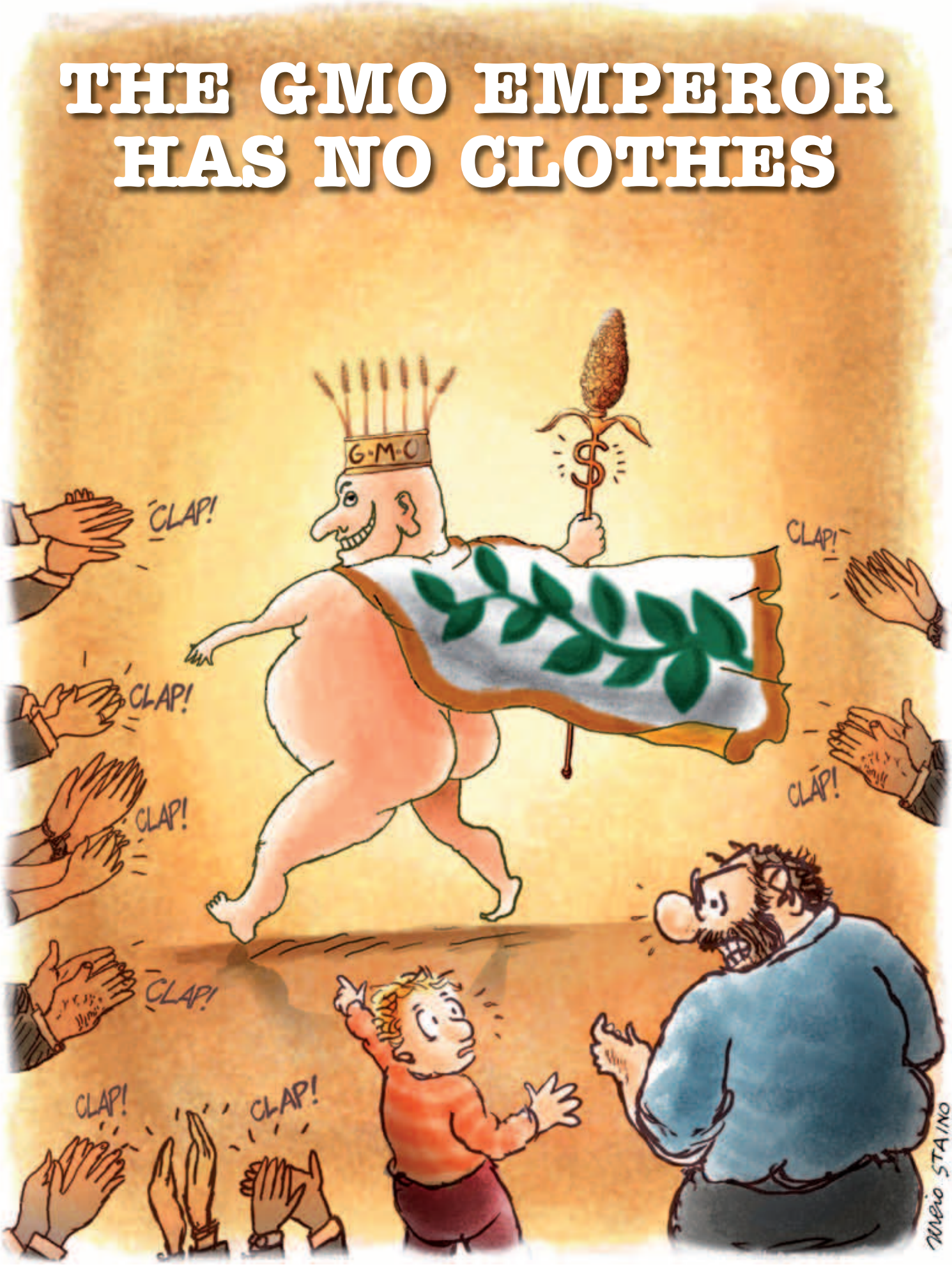
THE GMO EMPEROR HAS NO CLOTHES



A Global Citizens Report on the State of GMOs

Synthesis Report

THE GMO EMPEROR HAS NO CLOTHES

A Global Citizens Report on the State of GMOs - False Promises, Failed Technologies

Synthesis Report

Coordinated by Vandana Shiva, Navdanya
Debbie Barker, Centre for Food Safety
Caroline Lockhart, Navdanya International

Front page cartoon: Sergio Staino

Layout, production and printing: SICREA srl, Florence

Contact: info@navdanyainternational.it

Available for download at www.navdanyainternational.it
www.navdanya.org

Thanks go to all those who readily contributed in the realization of this report, particularly Sergio Staino, creator of the cover cartoon, Maurizio Izzo of Sicrea for production and Massimo Orlandi for press and communications.

Thanks also go to Christina Stafford and interns Tara McNerney and Tanvi Gadhia of Center for Food Safety (CFS) and Sulakshana Fontana, Elena Bellini and Filippo Cimo of Navdanya International for their diligent coordination, editing and translation efforts.

Final thanks also go to Giannozzo Pucci, Maria Grazia Mammuccini and Natale Bazzanti for their cooperation and assistance in realizing this report.

This publication is printed on ecological paper SYMBOL FREELIFE SATIN ECF

A Global Citizens Report on the State of GMOs - False Promises, Failed Technologies

Coordinated by Navdanya and Navdanya International,
the International Commission on the Future of Food and Agriculture,
with the participation of The Center for Food Safety (CFS)

Contributing organizations:

THE AMERICAS

Center for Food Safety (CFS) USA

Center of Studies for Rural Change in Mexico (CECCAM)

Network for a GE Free Latin America (RALLT)

Amigos della Tiera Uruguay (REDES)

Uruguay Sustentable

Conservation Land Trust, Patagonia

EUROPE

Navdanya International

Confédération Paysanne, Via Campesina, France

Save our Seeds, (SOS), Germany

Italian Association for Organic Agriculture (AIAB), Italy

Foundation for organic and biodynamic research (FIRAB), Italy

Blueridge Institute, Switzerland

International Coalition to Protect the Polish Countryside (ICPPC), Poland

World Peace Culture Fund Genetic Resources Conservation, Russia

AFRICA

African Biodiversity Network (ABN)

Friends of the Earth, Africa

Gaia Foundation

ASIA PACIFIC

Navdanya, India

NO! GMO Campain, Japan

Gene Ethics, Australia

Madge, Australia

And leading scientists and activists committed to sustainable food and agricultural systems.

The GMO Emperor Has No Clothes

The Emperor's New Clothes is a story by Hans Christian Andersen about an emperor who hires two tailors who promise to make him a set of remarkable new clothes that will be invisible to anyone who is either incompetent or stupid. When the emperor goes to see his new clothes, he sees nothing at all — for the tailors are swindlers and th ere aren't any clothes. Afraid of being judged incompetent or stupid, the emperor pretends to be delighted with the new clothes and "wears" them in a grand parade through the town. Everyone else also pretends to see them, until a child yells out, "He hasn't got any clothes on!" However, the Emperor arrogantly continues parading with his courtiers as though there was no problem.

Hans Christian Andersen's fable is an apt parody for what is happening today with genetically modified organisms (GMOs) in food and agriculture. The GMO Emperor Monsanto has no clothes: its promises to increase crop yields and feed the hungry have proven to be false; its genetic engineering to control weeds and pests have created super weeds and super pests. Yet the Emperor struts around hoping the illusion will last and the courtiers, not wanting to be seen as stupid, will keep applauding and pretending they see the magnificent robes of the GMO emperor.

The fable that GMOs are feeding the world has already led to large-scale destruction of biodiversity and farmers' livelihoods. It is threatening the very basis of our freedom to know what we eat and to choose what we eat. Our biodiversity and our seed freedom are in peril. Our food freedom, food democracy and food sovereignty are at stake.

Citizens around the world can see the false promises and failures of GMOs. And like the child who speaks up, are proclaiming "What the Emperor is telling us is not true. It is an illusion. The GMO Emperor has no clothes".

Joining together to say that "The GMO Emperor has no clothes" empowers citizens to create a GMO-free world, rich in biodiversity and healthy food. It also advances alternatives that are truly sustainable and provides food security and food democracy for all.

Synthesis Report

CONTENTS

The Synthesis Report of the Emperor Has No Clothes : Global Citizens Report on GMOs – False Promises, Failed Technologies, is available in hard copy . The full Report is available on the web at: www.navdanyainternational.it.
The Synthesis Report includes Sections I, II, III, VI and VII of the full Report as well as quotes from authors of articles from section IV, Voices from Grass Roots and section V, Voices from Science.

I. INTRODUCTION

Dr. Vandana Shiva*

People who point out the emptiness of the pretensions of powerful people and institutions are often compared to the child in Hans Christian Andersen's fable who says that the emperor has no clothes.

We have been repeatedly told that genetically engineered (GE) crops will save the world by increasing yields and producing more food. They will save the world by controlling pests and weeds. They will save the world by reducing chemical use in agriculture. They will save the world with GE drought tolerant seeds and other seed traits that will provide resilience in times of climate change.

However, the GE emperor (Monsanto) has no clothes. All of these claims have been established as false over years of experience all across the world. The Global Citizens Report "The GMO Emperor Has No Clothes" brings together evidence from the ground of Monsanto's and the industry's false promises and failed technology.

Failure to Yield

Contrary to the claim of feeding the world, genetic engineering has not increased the yield of a single crop. Navdanya's research in India has shown that contrary to Monsanto's claim of Bt cotton yield of 1500 kg per acre, the reality is that the yield is an average of 400-500 kg per acre. Although Monsanto's Indian advertising campaign reports a 50 percent increase in yields for its Bollgard cotton, a survey conducted by the Research Foundation for Science, Technology and Ecology found that the yields in all trial plots were lower than what the company promised.

Bollgard's failure to deliver higher yields has been reported all over the world. The Mississippi Seed Arbitration Council ruled that in 1997, Monsanto's Roundup Ready cotton failed to perform as advertised, recommending payments of nearly $2 million to three cotton farmers who suffered severe crop losses.

Failure to Yield, a report by the Union of Concerned Scientists in the U.S., has established that genetic engineering has not contributed to yield increases in any crop. According to this report, increases in crop yields in the U.S. are due to yield characteristics of conventional crops, not genetic engineering.
Australian research shows that conventional crops outperform GE crops.

Yield Comparison of GE Canola trials in Australia

	2001	
Conventional	1144	
Round Up Ready GE	1055	(Two application of Round Up)
	977	(One application of Round Up)

(Source: Monsanto, as reported in Foster (2003) – *http://www.non-gm-farmers.com/documents/GM Canola report-full.pdf*

New South Wales	**2001**
In Vigor (GE)	109
Hyola (Conventional)	120

(Source: Bayer Crop Science Website)

Despite Monsanto adding the Roundup Ready gene to 'elite varieties', the best Australian trials of

Roundup Ready Canola yielded only 1.055 t/ha, at least 16 percent below the national average of 1.23 t/ha *(http://www.non-gm-farmers.com/documents/GM Canola report-full.pdf)*.

As Marc Lappe and Britt Bailey report in their book Against the Grain, herbicide-resistant soybeans yielded 36 to 38 bushels per acre, while hand tilled soybeans yielded 38.2 bushels per acre. According to the authors, this raises the possibility that the gene inserted into these engineered plants may selectively disadvantage their growth when herbicides are not applied. "If true, data such as these cast doubt on Monsanto's principal point that their genetic engineering is both botanically and environmentally neutral," the authors write. (Marc Lappe and Britt Bailey, *Against the Grain: Biotechnology and the Corporate Takeover of Your Food*, Monroe, ME: Common Courage Press, 1998).

While increased food productivity is the argument used to promote genetic engineering, when the issue of potential economic impacts on farmers is brought up, the biotechnology industry itself argues that genetic engineering does not lead to increased productivity. Robert Shapiro, CEO of Monsanto, referring to Posilac (Monsanto's bovine growth hormone) in Business Ethics, said on the one hand that "There is need for agricultural productivity, including dairy productivity, to double if we want to feed all the people who will be joining us, so I think this is unequivocally a good product." On the other hand, when asked about the product's economic impact on farmers, he said that it would "play a relatively small role in the process of increasing dairy productivity."

In twenty years of commercialization of GE crops, only two traits have been developed on a significant scale: herbicide tolerance, and insect resistance (Bt crops).

Failed Technology: GE crops do not control pests and weeds, they create super pests and super weeds

Herbicide tolerant (Roundup Ready) crops were supposed to control weeds and Bt crops were intended to control pests. Instead of controlling weeds and pests, GE crops have led to the emergence of super weeds and super pests. In the U.S., Round Up Ready crops have produced weeds resistant to Round Up. Approximately 15 million acres are now overtaken by Roundup resistant "superweeds", and, in an attempt to stop the spread of these weeds, Monsanto has started offering farmers a "rebate" of up to $6 per acre for purchasing and using other, more lethal herbicides. These rebates offset approximately 25 to 35 percent of cost of purchasing the other herbicides. [1]

In India, Bt cotton sold under the trade name "Bollgard" was supposed to control the Bollworm pest. Today, the Bollworm has become resistant to Bt cotton and now Monsanto is selling Bollgard II with two additional toxic genes in it. New pests have emerged and farmers are using more pesticides.

Bt crops: A Recipe for Super Pests

Bt is a naturally occurring organism Bacillus thuringiensis which produces a toxin. Corporations are now adding genes for Bt toxins to a wide array of crops to enable the plants to produce their own insecticide.

Monsanto sells its Bt potato as 'Nature Mark' in Canada and describes it as a plant using "sunshine, air and soil nutrients to make a biodegradable protein that affects just one specific insect pest, and only those individual insects that actually take a bite of the plants."

The camouflaged description of a transgenic crop hides many of the ecological impacts of genetically engineered crops. The illusion of sustainability is manufactured through the following distortions.

1. The Bt Plant does not merely use 'sunshine, air, and soil nutrients'. Bt crops are transgenic and have a gene from a bacterium called bacillus thuringiensis (bt) which produces the Bttoxin. In addition it has antibiotic resistance marker genes and genes from viruses as promoters.
2. The so called 'biodegradable protein' is actually a toxin which the gene continuously produces in the plant. This protein has been found in the blood of pregnant women and their fetuses.
3. Insect pests like the cotton bollworm which destroy cotton can actually evolve resistance because of continuous release of the toxin and hence become 'super pests'.
4. The Bt crop does not affect 'just one specific pest'. Beneficial insects like bees and ladybirds can be seriously affected. A Cornell study showed that the Bt toxin affected the Monarch

[1] http://blogs.desmoinesregister.com/dmr/index.php/2010/10/19/monsanto-paying-farmers-to-increase-herbicide-use/

butterfly. Navdanya's studies have shown that soil micro-organisms are negatively affected.

The primary justification for the genetic engineering of Bt into crops is that this will reduce the use of insecticides. Bt cotton is among the 'miracles' being pushed by corporations like Monsanto as a solution to the pesticide crisis. One of the Monsanto brochures had a picture of a few worms and stated, "You will see these in your cotton and that's O.K. Don't spray." However, in Texas, Monsanto faced a lawsuit filed by 25 farmers over Bt cotton planted on 18,000 acres which suffered cotton bollworm damage and on which farmers had to use pesticides in spite of corporate propaganda that genetic engineering meant an end to the pesticide era. In 1996, two million acres in the US were planted with Monsanto's transgenic Bollgard cotton.

However, cotton bollworms were found to have infested thousands of acres planted with the new breed of cotton in Texas. Not only did the genetically engineered cotton not survive cotton bollworm attack, there are also fears that the strategy will create super bugs by inducing Bt – resistance in pests. The question is not whether super-pests will be created, but when they will become dominant. The fact that the Environmental Protection Agency (EPA) of the US requires refugia of non-engineered crops to be planted near the engineered crops reflects the reality of the creation of resistant strains of insects.

The widespread use of Bt containing crops could accelerate the development of insect pest resistance to Bt which is used for organic pest control. Already eight species of insects have developed resistance to Bt toxins, either in the field or laboratory, including the diamond back moth, Indian meal moth, tobacco budworm, Colorado potato beetle, and two species of mosquitoes.

A new Super Pest which has become Resistant to GM Corn

The genetically engineered Bt crops continuously express the Bt toxin throughout its growing season. Long term exposure to Bt toxins promotes development of resistance in insect populations, this kind of exposure could lead to selection for resistance in all stages of the insect pest on all parts of the plant for the entire season.

Due to this risk of pest resistance, the EPA offers only conditional and temporary registration of varieties producing Bt. The EPA requires four percent 'refugia' with Bt cotton, meaning four percent of planted cotton is conventional and does not express the Bt toxin. It therefore acts as a refuge for insects to survive and breed, and hence keeps the overall level of resistance in the population low. Even at a 4 percent refugia level, insect resistance will evolve in as little as three to four years.

Herbicide Resistant Crops: A Recipe for Superweeds

Herbicide resistant crops such as Roundup Ready cotton can create the risk of herbicide resistant "superweeds" by transferring the herbicide resistance to weeds. Monsanto has confirmed that a notorious Australian weed, rye grass, has developed tolerance to its herbicide Roundup, thus rendering genetic engineering of herbicide resistant crops a useless strategy.

In 1994, research scientists in Denmark reported strong evidence that an oilseed rape plant genetically engineered to be herbicide tolerant transmitted its transgene to a weedy natural relative, Brassica campestris ssp. Campestris. This transfer can become established in the plant in just two generations.

In Denmark, B. campestris is a common weed in cultivated oilseed rape fields, where selective elimination by herbicides is now impossible. The wild relative of this weed is spread over large parts of the world. One way to assess the risk of releasing transgenic oilseed rape is to measure the rate of natural hybridization with B. campestris, because certain transgenes could make its wild relative a more aggressive weed, and even harder to control.

Although crosses with B. campestris have been used in the breeding of oilseed rape, natural interspecific crosses with oilseed rape was generally thought to be rare. Artificial crosses by hand pollination carried out in a risk assessment project in the U.K were reported unsuccessful. However, a few studies have reported spontaneous hybridization between oilseed rape and the parental species B. campestris in field experiments. As early as 1962, hybridization rates of zero percent to 88 percent were measured for oilseed rape and

wild B. campestris. The results of the Danish team showed that high levels of hybridization can occur in the field. Their field tests revealed that between nine percent and 93 percent of hybrid seeds were produced under different conditions. (Jorgensen, R.B and Anderson, B., (1994), "Spontaneous Hybridization between oilseed rape (Brassica Napus) and weedy B.Campestriz (Brassicaceae): A risk of growing genetically modified oilseed rape", American Journal of Botany).

The scientists also warn that as the gene for herbicide resistance is likely to be transferred to the weed, this herbicide strategy will be useless after a few years. Like many other weeds, B. campestris is characterized by seed dormancy and longevity of the seeds. Therefore, B. campestris with transgenes from oilseed rape may be preserved for many years in spite of efforts to exterminate it. They conclude that weedy B. campestris with this herbicide tolerant transgene may present economic risks to farmers and the biotechnology industry. Finally, natural ecosystems may also be affected.

Other concerned scientists add that the potential spread of the transgene will indeed be wide because oilseed rape is insect-pollinated and bees are known to fly far distances. The existence of the wild relative of B. campestris in large parts of the world poses serious hazards once the transgenic oilseed rape is marketed commercially. In response to the Danish findings, the governments of Denmark and Norway have acted against the commercial planting of the engineered plant, but the U.K Government has approved its marketing.

Wild beets have become a major problem in European sugar beet production since the 1970s. These weedy populations arise from seeds originating from the accidental pollinations of cultivated beets by adventitious beets in the seed production area. The existence of gene exchange via seed and pollen between weed beets and cultivated beets shows genetically engineered sugar beets to be herbicide resistant, with the possibility of becoming "super-weeds." In this case, the efficacy of herbicide resistant crops totally undermined. (P. Bondry, M. Morchen, P. Sanmiton-Laprade, Ph. Veernat, H.Van Dyk, "The origin and evolution of weed beets: Consequences for the breeding and release of herbicide resistant transgenic sugar beets: Theor-Appl Genet (1993), 87:471-78).

Current surveys indicate that almost 20 percent of U.S producers have found glyphosate resistant (Roundup Resistant) weeds on their farms. *(http://farmindustrynews.com/crop-protection/diversification-prevents-weed-resistance-glyphosate)*

Referring to Round Up Resistant weeds, Andrew Wargo III, the President of the Arkansas Association of Conservation Districts said, "It is the single largest threat to production agriculture that we have ever seen". (William Neuman & Andrew Pollack, Farmers Cope with Round-Up Resistance Weeds, New York Times, 4th May 2010).

There are now ten resistant species in at least 22 states infesting millions of acres, predominantly soybeans, cotton, and corn. Roundup Resistant weeds include pig weed, rag weed, and horse weed.

Today, Roundup Ready crops account for 90 percent of soybeans and 70 percent of corn and cotton grown in the US.
Mike Owen, a Weed Scientist at Iowa State University has cautioned: "What we're talking about here is Darwinian evolution in fast-forward."

As a result of this weed resistance, farmers are being forced to use more herbicides to combat weeds. As Bill Freese of the Center for Food Safety in Washington, D.C., says "The biotech industry is taking us into a more pesticide dependent agriculture, and we need to be going in the opposite direction."
The problem of "superweeds" is so severe that U.S Congress organized a hearing on it titled "Are Superweeds an Outgrowth of USDA Biotech Policy".
(http://westernfarmpress.com/management/super-weeds-put-usda-hotseat)

Superweeds infest a GM corn field

As Roy Troush, an Indiana farmer, stated in his testimony: "In 2005 we first began to encounter problems with glyphosate-resistance in both our soybean and corn crops. Despite well documented proof that glyphosate tolerant weeds were becoming a significant problem, the Monsanto

scientist insisted that resistance existed and instructed me to increase my application rates. The increase in application proved ineffectual. In 2008, we were forced to include the use of 2,4-D and an AIS residual in our program. Like most farmers, we are very sensitive to environmental issues, and we were very reluctant to return to using tillage and more toxic herbicides for weed control. However, no other solutions were then or now readily available to eradicate the weed problems caused by development of glyphosate resistance".

When introduced to regions such as China, Taiwan, Japan, Korea and former USSR where wild relatives of soy are found, Monsanto's Roundup Ready Soya bean could transfer the herbicide resistant genes to wild relatives leading to new weed problems.

The native biodiversity richness of the Third World thus increases the environmental risks of introduced genetically modified species.

The genetic engineering miracle is quite clearly faltering in farmers' fields. Yet the information on the hazards and risks does not accompany the sales promotion of genetically engineered crops in India. Nor does the false promise of the biotech miracle inform farmers that the genetic engineering era of farming also requires 'high-tech slavery' for farmers.

False Promises

1. Reduced Use of Chemicals

Despite claims that genetically modified organisms (GMOs) will lower the levels of chemicals (pesticides and herbicides) used, this has not been the case. This is of great concern both because of the negative impacts of these chemicals on ecosystems and humans, and because there is the danger that increased chemical use will cause pests and weeds to develop resistance, requiring even more chemicals in order to manage them.

In India:

- A survey conducted by Navdanya in Vidharbha showed that pesticide use has increased 13-fold there since Bt cotton was introduced.
- A study recently published in the Review of Agrarian Studies also showed a higher expenditure on chemical pesticides for Bt cotton than for other varieties for small farmers. (*Are there Benefits from the Cultivation of Bt cotton?* Review of Agrarian Studies Vol 1(1) January-June 2011. Madhura Swaminathan* and Vikas Rawal)
- Non-target pest populations in Bt cotton fields have exploded, which will likely erode and counteract any decrease in pesticide use (Glenn Davis Stone. *Field versus Farm in Warangal: Bt cotton, Higher Yields, and Larger Questions.* World Development, 2011; 39 (3): 387)

In China, where Bt cotton is widely planted:

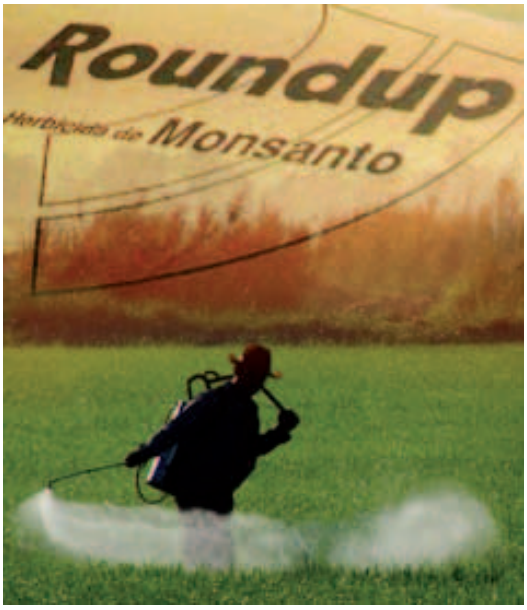
- Populations of mirid bugs, pests that previously posed only a minor problem, have increased 12-fold since 1997. A 2008 study in the International Journal of Biotechnology found that any financial benefits of planting Bt cotton had been eroded by the increasing use of pesticides needed to combat non-target pests. ("Benefits of Bt cotton elude farmers in China" GM Watch, *http://www.gmwatch.org/latest-listing/1-news-items/13089*).

In the US, due mainly to the widespread use of Roundup Ready seeds:

- Herbicide use increased 15 percent (318 million additional pounds) from 1994 to 2005—an average increase of ¼ pound per each acre planted with GM seed—according to a 2009 report published by the Organic Center. (*http://www.organic-center.org/science.pest.php?action=view&report_id=159*).
- The same report found that in 2008, GM crops required 26 percent more pounds of pesticides per acre than acres planted with conventional varieties, and projects that this trend will continue due to the spread of glyphosate-

resistant weeds. (*http://www.organic-center.org/science.pest.php?action=view&report_id=159)*.

- Moreover, the rise of glyphosate (the herbicide in Roundup Up)- resistant weeds has made it necessary to combat these weeds by employing other, often more toxic herbicides. This trend is confirmed by 2010 USDA pesticide data, which shows skyrocketing glyphosate use accompanied by constant or increasing rates of use for other, more toxic, herbicides. (Despite Industry Claims, Herbicide Use Fails to Decline with GM Crops." GM Watch. *http://www.gmwatch.org/latest-listing/1-news-items/13089*)
- Moreover, the introduction of Bt corn in the US has had no impact on insecticide use, and while Bt cotton is associated with a decrease in insecticide use in some areas, insecticide applications in Alabama, where Bt cotton is planted widely, doubled between 1997 and 2000. (Benbrook, Charles. "Do GM Crops Mean Less Pesticide Use?" Pesticide Outlook, October 2001. *http://www.biotech-info.net/benbrook_outlook.pdf*).



In Argentina, after the introduction of Roundup Ready soya in 1999:

- Overall glyphosate use more than tripled by 2005. A 2001 report found that Roundup Ready soya growers in Argentina used more than twice as much herbicide as conventional soya growers. ("Who Benefits from GM Crops? Feed the Biotech Giants, Not the World's Poor." Friends of the Earth International, February 2009). *(http://www.foei.org/en/resources/publications/pdfs/2009/gmcrops2009exec.pdf)*
- In 2007, a glyphosate-resistant version of Johnsongrass (considered one of the worst and most difficult weeds in the world) was reported on more than 120,000 hectares of prime agricultural land - a consequence of the increase in glyphosate use. (Ibid)

As a result, it was recommended that farmers use a mix of herbicides other than glyphosate (often more toxic) to combat the resistant weeds, and it is estimated that an additional 25 liters of herbicides will be needed each year to control the resistant weeds. (Ibid).

In Brazil, which has been the worlds' largest consumer of pesticides since 2008:
("Use of Pesticides in Brazil continues to Grow." GM Watch, April 18 2011. *http://www.gmwatch.org/latest-listing/1-news-items/13072-use-of-pesticides-in-brazil-continues-to-grow*).

- GE crops became legally available in 2005, and now make up 45 percent of all row crops planted in Brazil — a percentage that is only expected to increase. (Brazilian Farmers are Rapidly Adopting Genetically Modified Crops." Soybean and Corn Advisor, March 10, 2010. http://www.soybeansandcorn.com/news/Mar10_10-Brazilian-Farmers-Are-Rapidly-Adopting-Gentically-Modified-Crops)
- Soy area has increased 71 percent, but herbicide use has increased 95 percent. ("GM Agriculture: Promises or Problems for farming in South Africa?" (BioWatch South Africa, May 16 2011. *http://www.sacau.org/hosting/sacau/SacauWeb.nsf/SACAU 2011_Biowatch- GM agriculture Promises or problems for farming in South Africa.pdf*)
- Of 18 herbicide-resistant weed species reported, five are glyphosate-resistant. ("Use of Pesticides in Brazil continues to Grow." GM Watch, April 18 2011. *http://www.gmwatch.org/latest-listing/1-news-items/13072-use-of-pesticides-in-brazil-continues-to-grow*)
- In 2009, total herbicide active ingredient use was 18.7 percent higher for GE crops than conventional ("GM Crops: Global socio-economic and environmental impacts 1996-2009" Graham Brookes and Peter Barfoot. PG Economics Ltd. UK. 2011).

2. Climate Resilience

Monsanto has been claiming that through genetic engineering it can breed crops for drought tolerance and other climate-resilient traits. This is a false promise. As the U.S. Department of Agriculture (USDA) has said in its draft

environmental assessment of the new drought-resistant GE corn, "Equally comparable varieties produced through conventional breeding techniques are readily available in irrigated corn production reviews." ("USDA Looks to Approve Monsanto's Draught-Tolerant Corn," *The New York Times*, May 11, 2011.)

Helen Wallace of GeneWatch UK cautions: "The GE industry must now stop its cynical attempts to manipulate the public into believing that GE crops are needed to feed the world." (GeneWatch UK press release, "Draught-Tolerant GM Corn Will Not Feed the World," May 13, 2011.)

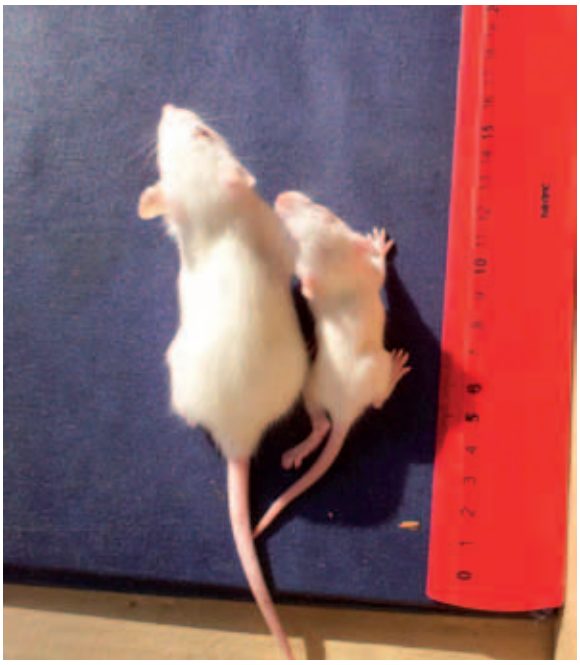
Other biotech industries also falsely claim that they are inventing climate resilient traits. As Ram Kaundiya, CEO of Advanta, India and Chairman of Biotech Led Enterprises – Agriculture Group - writes, "Very exciting input traits are in the pipeline. For example, a water use efficiency trait will reduce the water requirements of the crops considerably and can help vast numbers of farmers who cultivate rainfed crops in the country in more than 100 million ha. Similarly, the nitrogen use efficiency trait which will reduce the use of nitrogenous fertilizer on the crops by an estimated 30 percent. Another trait that is waiting in the wings is a salt tolerance trait which can help farmers grow crops in saline soils of more than 20 million ha in India." There are 1600 patents on climate resilient crops (Biopiracy of Climate Resilient Crops: Gene Giants Steal Farmers Innovation of Drought Resistant, Flood Resistant and Soil Resistant Varieties, Navdanya/ RFSTE, June 2009 & *www.etcgroup.org*)

But all these traits have already been evolved the traditional way by Indian farmers. Navdanya's seed collections have drought tolerant varieties like Nalibakuri, Kalakaya, Atia, Inkiri etc., flood tolerant varieties like Nalidhulia, Ravana, Seulapuni, Dhosarakhuda etc., and salt tolerant varieties like Bhundi, Kalambank, Lunabakada, Sankarchin etc.

Pulses and beans are nitrogen fixing crops. None of these traits are "invented" by genetic engineering. They are pirated from nature and farmers.

3. Health Safety

While the GE Emperor has no clothes—i.e., GE crops cannot feed the world, it has the potential for harming the world and enslaving the world. Among the false claims made by Monsanto and the Biotechnology industry is that GE foods are safe. However, there are enough independent studies to show that GE foods can cause health damage.



Experiment by Irina Ermakova: influence of GM-soy (Roundup Ready) on same age rats : control group on left, GM-soy on right with pups small sizes and weights

For example, Dr. Arpad Pusztai's research has shown that rats fed with GE potatoes had enlarged pancreases, their brains had shrunk, and their immunity had been damaged. Dr. Eric Seralini's research demonstrated that organ damage can occur.

The Committee of Independent Research and Information on Genetic Engineering (CRIIGEN) and universities at Caen and Rouen were able to get raw data of Monsanto's 2002 feeding trials on rats at the European Council order and made it public in 2005. The researchers found that rats fed with three approved corn varieties of GE corn—Mon 863, insecticide products, Mon 810, and Roundup Ready herbicide —suffered organ damage. The data "clearly underlines adverse impacts on kidneys and liver, the dietary, detoxifying organs as well as different levels of damages to the heart, adrenal glands, spleen and haematopoietic systems," according to Dr. Gilles Eric Seralini, a molecular biologist at the University of Caen. ("A Comparison of the Effects of Three GM Corn Varieties on Mammalian Health," Joel Spiroux de Veu de Mois, Francois Roullier, Dominique Cellise, Gilles Eric Serelini, *International Journal of Biological Science*s, 2009, 5: 706-726).

The Biotechnology Industry attacked Dr. Pusztai and Dr. Seralini and every scientist who has done independent research on GMOs. GMOs cannot

co-exist with the independence and freedom of science.
A Canadian study showed that traces of the Bt toxin from Monsanto Bt corn were found in the blood of 93 percent of women and 80 percent of their umbilical cord and fetal blood (Aris A, Leblanc S, "Maternal and fetal exposure to pesticides associated to genetically modified foods in Eastern Township of Quebec, Canada", Reproductive Toxicology, May 31, 2011 (4) 526-33, Epub 2011 Feb/8).

Monsanto's false argument for safety was that the Bt toxin in Bt crops poses no danger to human health because the protein breaks down in the human gut. However, the study shows that the Bt toxin survives in the blood of pregnant women and is also detected in fetal blood.

Evidence of liver and kidney toxicity appeared when rats were fed an approved GE maize variety (Mon 863) (Seralini GE, Cellier D. & Spironx de Vendomois, J, 2007, "New analysis of rat feeding study with a GM Maize", Archives of Environmental Contamination and Toxicology, 10,1007, S 00244-006-0149-5). Similar effects were observed when Monsanto fed its GT-73 Roundup Ready canola variety to rats. The rats showed a 12 percent to 16 percent increase in liver weight. (Greenpeace (2004) "Greenpeace critique of Monsanto's Roundup Ready Oilseed rape, GT-73", *http://www.greenpeace.at/uploads/media/GT73_Greenpeace_comments_Oct_2004_01.pdf*).

In 2005 CSIRO abandoned a decade long project to develop GE peas after tests showed they caused allergic lung damage in mice. (Young E. (2005) GM Pea causes allergic damage in Mice, New Scientist, *http://www.newscientist.com/article/dn8347-gm-pea-causes-allergic-damage-in-mice.html*).

A survey was conducted by Navdanya under Bt cotton growing areas of Vidharbha. Twenty-five fields were selected where Bt cotton was grown for three years, which was compared with the adjoining fields where either other varieties of cotton were growing or other crops were growing during that period. The areas covered between Nagpur, Amravati, Wardha and adjoining areas. The result showed significant reduction in acid phosphatase (26.6 percent), nitrogenase (22.6 percent) and dehydrogenase (10.3 percent) activities under Bt cotton growing fields. A slight reduction in esterase (7.6 percent) and alkaline phosphatase (0.7 percent) activity was observed but the results are not statistically significant. The results clearly demonstrated that Bt cotton cultivation definitely affect soil biological health especially beneficial microorganisms (actinomycetes, bacteria) and enzymes (acid phosphatase, nitrogenase and dehydrogenase). (Effect on Soil Biological Activities due to Cultivation of Bt cotton, Navdanya, 2008).

Other statements and scientific studies done on the risks posed to human health by Bt:

- In general, main health concerns are toxicity and allergenicity.
- Even the World Health Organization (WHO) cautions that "Different GM organisms include different genes inserted in different ways. This means that individual GM foods and their safety should be assessed on a case-by-case basis and that it is not possible to make general statements on the safety of all GM foods."("20 Questions on Genetically Modified Foods." World Health Organization. *http://www.who.int/foodsafety/publications/biotech/20questions/en/*).
- Many studies have shown that Bt poses potential risks to insects and animals, but there has been little study of its potential impact on human health. ("Why GM Crops are Dangerous" People and Planet, February 5 2009. *http://www.peopleandplanet.net/?lid=29012&section=34&topic=27*).
- 1999 Nature study showed adverse effects of transgenic pollen (from Bt corn) on monarch butterflies: butterflies reared on milkweed leaves dusted with bt corn pollen ate less, grew more slowly, and suffered higher mortality. (J. Losey, LS. Rayor, M.E. Carter. "Transgenic pollen harms monarch larvae" Nature vol 399. May 20 1999).
- Evidence of organ damage: A 1999 study showed that rats fed GE potatoes experience adverse effects on their intestinal tracts. (SWB Ewen, A. Puzstai. "Effect of diets containing genetically modified potatoes expressing Galanthus nivalis lectin on rat small intestine." The Lancet, Vol 354 issue 9187, pages 1353-1354, 16 October 1999.). In addition, rats fed GE tomatoes developed stomach lesions, and rats fed a different kind of GM potatoes had smaller and atrophied livers. Rats fed Bt corn had liver lesions, and rabbits fed GE soy showed altered enzyme production in their livers as well as higher metabolic activity. Rats fed Roundup Ready soybeans also showed structural changes in their livers. (C Verma, S Nanda, RK Singh, RB Singh, and S Mishra. "A Review on Impacts of Genetically Modified Food on Human Health." The Open

Nutraceuticals Journal, 2011, 4, 3-11)
- Evidence of allergies in animal trials: GE potatoes caused immune systems of rats to respond more slowly; GE peas provoked inflammatory response in mice, suggesting that they might cause deadly allergic reactions in people. (Ibid)
- Bt toxins have killed many species of insect larvae. (Ibid)
- There have been reports of thousands of Indian farmers experiencing allergic reactions after picking Bt cotton. Thousands of sheep deaths have been reported in AP after the sheep grazed on Bt cotton. (http://www.gmwatch.org/latest-listing/1-news-items/10585-why-gm-crops-are-dangerous)
- A 2001 CDC study found 28 subjects had experienced apparent allergic reactions after ingesting GM corn. (CDC report to FDA. Investigation of human illness associated with potential exposure to Cry9c. June 11, 2001. Available at: *http://www.cdc.gov/nceh/ehhe/cry9creport/pdfs/cry9creport.pdf*).

4. The Myth of Substantial Equivalence

The safety debate has been repeatedly suppressed by bad science. One of the unscientific strategies used to extinguish the safety discussion is to tautologically define a novel organism or novel food created through genetic engineering as 'substantially equivalent' to conventional organisms and foods. However, genetically engineered crop or food is different because it has genes from unrelated organisms – it cannot, therefore, be treated as equivalent to a non-genetically engineered crop or food. In fact, the biotechnology industry itself gives up the claim of 'substantial equivalence' when it claims patents on GMOs on grounds of novelty.

While governments and government agencies promoting genetic engineering refer to 'sound science' as the basis for their decisions, they are manipulating scientific data and research to promote the interests of the biotechnology industry while putting citizen health and the environment at risk. The report by EPA scientists entitled "Genetic Gene: The premature commercial release of genetically engineered bacteria" and the report by Andrew Christiansen "Recombinant Bovine Growth Hormone: Alarming Tests, Unfounded Approval: The Story Behind the Rush to Bring rBGH to the market" show in detail how regulatory agencies have been manipulated on issues of safety.

Scientific agencies have been split and polarized into two communities – a corporate science community and a public science community. The corporate science community participates in distorting and manipulating science. Among the distortions of corporate science is the assumption of 'substantial equivalence' which is falsified both by the research done by the public science community as well as by the intellectual property rights claims of the biotechnology industry itself.

When industry wants to avoid risk assessment and issues of liability, the argument used is that the genetically engineered organism is 'substantially equivalent' to the non-engineered parent. However, when industry wants property rights, the same GMO becomes 'novel' or substantially inequivalent to the parent organism.

When a safety and intellectual property rights discourse of the genetic engineering industry is put side by side what emerges is an unscientific, incoherent undemocratic structure for total control through which absolute rights are claimed and all responsibility is denied and disclaimed.

This ontological schizophrenia is based on and leads to incoherence, which is a characteristic of bad science. Good science is based on coherency. The consistency and incoherence between the discourse on property rights and the discourse on issues of safety contributes to undemocratic structures in which there are no mechanisms to protect citizens from corporate irresponsibility.

A second unscientific concept used to ignore biosafety considerations is 'significance'. Thus the EPA has argued that because we are surrounded by bacteria, the risk of introducing pathogenic bacteria through gene transfer is not significant. The EPA has argued that because the problem of antibiotic resistance already exists, any new risk is insignificant. These unscientific attempts to ignore risks or suppress scientific data on risks are examples of bad science, not good science.

Another strategy used to suppress good science by bad science is in the design of trials, and the extrapolation of data from artificially constructed contexts to real ecosystems.
The final strategy used is of direct arm twisting, used by the US administration repeatedly to kill the Biosafety protocol in the Convention of Biological Diversity (CBD), even though

the US is not a party to the Convention. In spite of it, the countries of the world adopted the Cartagena Protocol on Biosafety in 2000. It was also the strategy used against labeling of genetically engineered foods. However, the world agreed to GMO labelling in the Codex Alimentarius.

While constantly referring to science the US government is in fact promoting bad science, and with it, promoting ecological and human health risks. Instead of generating scientific understanding of the impacts of transferring genes, it is promoting deliberate ignorance.

'Don't Look, Don't See' "The Strategy of Deliberate Ignorance"

The false assumption of 'substantial equivalence' of GMOs and non-engineered organisms establishes a strategy of deliberate ignorance. Ignorance of the risks is then treated as proof of safety. 'Don't look – don't see' leads to total lack of information about the ecological impacts of genetic engineering.

It is often claimed that there have been no adverse consequences from more than 500 field releases in the US. However, the term 'releases' is completely misleading. Those tests were largely not scientific tests of realistic ecological concerns, yet 'this sort of non-data on non-releases has been cited in policy circles as though 500 true releases have now informed scientists that there are no legitimate scientific concerns'.

Recently, for the first time, the data from the US Department of Agriculture field trials were evaluated to see whether they support the safety claims. The Union of Concerned Scientists (UCS) that conducted the evaluation found that the data collected by the USDA on small-scale tests have little value for commercial risk assessment. Many reports fail to even mention – much less measure – environmental risks. Of those reports that allude to environmental risk, most have only visually scanned field plots looking for stray plants or isolated test crops from relatives. The UCS concluded that the observations that 'nothing happened' in those hundreds of tests do not say much. In many cases, adverse impacts are subtle and would never be registered by scanning a field. In other cases, failure to observe evidence of the risk is due to the contained conditions of the tests. Many test crops are routinely isolated from wild relatives, a situation that guarantees no outcrossing. The UCS cautioned that "…care should be taken in citing the field test record as strong evidence for the safety of genetically engineered crops" (Jane Rissler & Margaret Mellon, The Ecological Risks of Engineered Crops, The MIT Press, 1996).

The myth of safety of genetic engineering is manufactured through deliberate ignorance. Deliberate ignorance of the impacts is not proof of safety; it is a guarantee for disaster.

The scientific corruption by the biotech industry and the sacrifice of knowledge sovereignty began in 1992 with the concoction of the false principle of substantial equivalence. The false assumption of 'susbtantial equivalence' was introduced by President George H.W. Bush in US policy immediately after the Earth Summit in Rio de Janeiro to blunt the call for biosafety regulation. It was later formalized and introduced in 1993 by OECD (UN Organization for Economic Cooperation and Development), and subsequently endorsed by FAO (UN Food and Agriculture Organization) and WHO (World Health Organization). The OECD document states -

"For foods and food components from organisms developed by the application of modern biotechnology, the most practical approach to the determination is to consider whether they are substantially equivalent to analogous food products if such exist. The concept of substantial equivalence embodies the idea that existing organisms used as foods, or a s a source of food, an be used as the basis for comparison when assessing the safety of human consumption of food or food component that has been modified or is new."

Apart from being vague, this definition is unsound. Foods with Bt toxin genes are not the same as foods without. Herbicide-resistant crops are different from existing varieties because they have new genes for resistance to herbicide. An article by Marc Lappe and others in the Journal of Medicinal Food (1999) has established that Monsanto's Round Up Ready soya beans change the levels of phytoestrogens by 12 to 14 percent. To treat these differences as insignificant when it is a question of safety, and as significant when it is a question of patentability, is totally unscientific. As Millstone, Brunner and Mayer have stated in "Beyond Substantial Equivalence' (Nature, 7 October, 1999):

"Substantial equivalence is a pseudo-scientific concept because it is a commercial and political judgment masquerading as if it were scientific. It is, moreover, inherently anti-scientific because it was created primarily to provide an excuse for not requiring biochemical or toxicological tests. It, therefore, serves to discourage and inhibit potentially information scientific research."

The scientifically false principle of substantial equivalence was put in place in U.S immediately after the Earth Summit to undo the articles on Biosafety in the Convention on Biological Diversity.

The false assumption of "substantial equivalence" of GMOs GE and non-engineered organisms establishes a strategy of deliberate ignorance. Since the transgenic is never assessed, ignorance of risks is then treated as proof of safety. "Don't look, don't see, don't find" leads to total lack of information about the ecological impacts of genetic engineering.

"Substantial equivalence" also contradicts the claim to novelty and invention through patents. Mahyco has a patent on Bt Brinjal. When industry wants to avoid risk assessment and issues of liability, the argument used is that the genetically engineered organism is "substantially equivalent to the non-engineered parent organism. However, when industry wants intellectual property rights and patents, the same GMO become "novel" or substantially in-equivalent to the parent organism". This is ontological schizophrenia.

Besides the impact on health, GMOs have severe ecological impact, the most significant being genetic contamination. The Canadian farmer Percy Schmeiser lost his canola seed due to contamination from neighboring GE crops.

5. Genetic Contamination is Inevitable, Co-existence is not possible

In addition to causing harm to public health and ecosystems, GE seeds and crops provide a pathway for corporations to "own" seeds through patents and intellectual property rights (IPRs). Patents provide royalties for the patent holder and corporate monopolies. This translates into super profits for Monsanto. For the farmers this means debt. For example, more than 250,000 Indian farmers have been pushed to suicide in the last decade and a half. Most of the suicides are in the cotton belt where Monsanto has established a seed monopoly through Bt cotton.

At a conference in Washington, D.C. on the Future of Farming, U.S. Secretary of Agriculture, Tom Vilsack, referring to organic farming and GMOs said, "I have two sons, I love them both and I want them to coexist." Filmmaker Debra Grazia responded from the floor "but one of your sons is a bully."

GMOs contaminate non-GE crops. Contamination is inevitable, since cross-pollination is inevitable, within the same species or with close relatives.

The most dramatic case of contamination and genetic pollution is the case of Percy Schmeiser, a Canadian Canola seed grower, whose crop was contaminated by Monsanto's Round-Up Ready Canola. Instead of paying Percy for the damage of contamination in accordance with the "Polluter Pays" principle, Monsanto sued Percy for "Intellectual Property theft."

The contamination of canola in Canada is so severe that 90 percent of certified non GE Canola seed samples contain GE material *(www.lynnmaclaren.org.au/media-release-major-grain-traders-reject-gm-canola)*.

As Arnold Taylor, Chair of the Organic Agriculture Protection Fund said: *"There is no organic canola in Canada any more, virtually none, because the seed stock is basically contaminated… we've lost that crop"* (GM Canola 'contaminated', Canadian Farms, The Age.com.au, July 5, 2011).

In the Agriculture Canada study, scientists in Saskatoon found that nearly half of the 70 certified seed samples tested were contaminated with the Roundup Ready gene. Thirty-seven percent had the Liberty Link gene and 59 percent had both.

Reuters, 19 Sept.2011
Super weeds pose growing threat to U.S. crops
Farmer Mark Nelson yanks a four-foot-tall weed from his Kansas soybean field. The "waterhemp" towers above his beans, sucking up the soil moisture and nutrients his beans need to grow... "When we harvest this field, these waterhemp seeds will spread all over kingdom come" he said. An estimated 11 million acres are infested with "super weeds" some of which grow several inches in a day and defy even multiple dousings of the world's top-selling herbicide, Roundup, whose active ingredient is glyphosate.

Canadian researchers tested 33 samples of certified non-GE canola seed and found 32 samples contaminated with GE varieties – with three samples having contamination levels of more than two percent (Freisa L, Nelson, A & Van Acker, R, (2003) Evidence of contamination of pedigreed canola (brassica napus) seed lots in western Canada with genetically engineered herbicide resistance traits." Agronomy Journal, 95, 2003, pg. 1342 – 1347).

Another study in the US found that virtually all samples of non-GE corn, soy beans, and canola seed were contaminated by GE varieties (Mella M and Rissler J (2004), Gone to Seed: Transgenic Contaminates in the Traditional Seed Supply, Union of Concerned Scientists).

A study in the UK found that GE canola cross-pollinated with non-GE canola more than 26 km away (Ramsay G, Thompson C and Squire G, (2004). Quantifying landscape-scale gene flow in oil seed rape, Scottish Crop Research Institute and U.K Department of Environment, Food and Rural Affairs, (DEFRA), October 2004, p.4, *http://www.scri.ac.uk/scri/file/EPI/Agroecology/Landscape_scale_geneflow_in_oilseed_rape.pdf*).

An Australian study found that gene-carrying pollen from GE canola can travel up to three km via wind or insects. The present isolation distance in Canada between GE and non-GE canola is a mere 100 metres. (Studies show gene flow in GE canola likely widespread, by Ron Friesen, July 4, 2002, *http://monsanto.unveiled.info/canada/geneflow.htm)*.

The Canadian National Farmers Union (2005) stated "GE crop agriculture is incompatible with other forms of farming – non-GE and organic, for instance, because GE crops contaminate and because segregation is impossible (*http://www.non-gm-farmers.com/documents-GM-canola*).

A report of the Japanese Institute for Environmental Studies (JIES) confirmed that herbicide resistant genetically engineered canola plants had escaped into Japanese ecosystems at major shipping ports along the Japanese coast (*http://www.greenpeace.org/international/en/publications/reports/canola-report/*).

In a 2007 report by the Network of Concerned Farmers on "The Economies of genetically modified canola" it was assessed that if GM canola was introduced in Australia and 20 percent of farmers adopted it, non-GE farmers would suffer losses of $65.52 million due to contamination.

In December 2010, organic farmer Steve Marsh in Australia lost his organic status because his harvest was found contaminated with genetically modified Roundup Ready canola (*http://www.perthnow.com.au/news/special-features/gm-contamination-of-organic-crop-confirmed/*).

In August 2006, trace amounts of Bayer's experimental genetically engineered Liberty Link rice was found to have contaminated 30 percent of the Riceland in Texas, Louisiana, Missouri, Arkansas and Mississippi. The trials for the GE rice were being undertaken by Bayer and Louisiana State University at Crowley, LA. Within four days, the news of contamination led to decline in futures prices by 14 percent, costing growers $150 million. Exports fell as the European Union, Japan and Russia stopped importing long grain rice grown in the US. Eleven thousand US rice farmers sued Bayer for contaminating their rice and ruining their exports. On July 1, 2011, Bayer agreed to pay the farmers $750 million to settle (Bayer settles with farmers over modified rice seeds, New York Times, 2nd July, 2011 – *http://www.nytimes.com/2011/07/02/business/02rice.html*).

In 2001, D. Quist and I. Chapela of the University of Mexico published a study in Nature magazine "Transgenic DNA introgressed into traditional maize land races in Oaxaca, Mexico (nature, 414, 6863, November 29, 2001 p. 541-543). Their study showed that native maize had been contaminated by GE corn. This was in spite of the fact that it is illegal to grow GE maize in Mexico.

Mexico is the center of diversity of corn. This is where corn was domesticated and where the highest diversity of corn exists. According to the government, the contamination took place when farmers planted corn imported from the US, not knowing it was genetically modified.

In April 2002, the Mexican government confirmed contamination of native corn by GE corn. As Jorge Soberon, Secretary of Mexico's Biodiversity Commission, stated "This is the world's worst case of contamination by genetically modified material because it happened in the place of origin of a major crop. It is confirmed. There is no doubt about it" (C. Clover, "Worst ever GM crop Invasion, The Daily Telegraph, London, April 19, 2002, P. Brown, Mexico's Vital Gene Reservoir Polluted by Modified Maize, Guardian, London, April 19, 2002).

In 2003, native corn in Mexico was found contaminated by genetically modified varieties in corn fields in the states of Chihueha, Morelos, Durango, Mexico State, Puebla, Oaxace, San Luis Potosi, Tlaxcale and Veracruz. The analysis was carried out by a coalition of farmer's organizations. The contamination was a high as 33 percent in some samples.

The contamination of corn in Mexico is not just a biological phenomenon. It has cultural implications. As Aldo Gonzalez, a farmer from Sierra Juarez de Oaxaca stated, "The contamination of our traditional maize undermines the fundamental autonomy of our indigenous and farming communities because we are not merely talking about our food supply; maize is a vital part of our cultural heritage. (ETC, Genetic Pollution in Mexico's Center of Maize Diversity, Food First Backgrounder, Spring 2002, Vol. 8, No.2).

In 2000, Starlink Corn, a Bt crop patented by Aventis (newly acquired by Bayer) which had not been approved for human consumption, was found in supermarket products in the US when a coalition of environmental groups commissioned a testing of corn products. More than 70 types of corn chips and more than 80 types of taco shells had to be recalled, leading to major disruptions in US and international markets.

The peaceful coexistence of GMOs and conventional crops is a myth: environmental contamination via cross-pollination, which poses a serious threat to biodiversity, is unavoidable.

- GM GE pollen can potentially cross-pollinate with both non-GM GE crops and weeds, potentially creating pest-resistant super weeds. Insects and wind can carry pollen over kilometers, and the situation is further complicated by the fact that seeds can stay in the soil for years before germinating. Moreover, there is no sure way to prevent human error or illegal planting of GM GE seeds. (GM Contaminations Briefing" Friends of the Earth, January 2006. *http://www.foe.co.uk/resource/briefing_notes/gene_escape.pdf*)

  Separating fields of GM GE and non-GM GE seeds is not a sufficient precaution: low levels of pollution can be found as far as several hundred meters away, and it' is difficult to draw the line at which contamination can be prevented. An Australian study in 2002 found GM GE genes as far as 3 km from the source. Moreover, there was no obvious gradient of contamination corresponding to distance from the source: contamination is unpredictable. (Crop Pollen Spreads Further than Expected." NewScientist. June 27 2002. *http://www.newscientist.com/article/dn2471*).
  Wind and insects have been documented as carrying pollen over more than 20 km. (GM Contaminations Briefing." Friends of the Earth. January, 2006. *http://www.foe.co.uk/resource/briefing_notes/gene_escape.pdf*) Even with separation, contamination is really beyond human control: In March 2011, farmers found their canola fields contaminated by GE seed washed there by floods.
- In May 2011, a report found GE seedlings in three traditional maize fields in Uruguay. ("GM Maize contaminates non-GM crops in Uruguay." Daniela Hirschfeld. Scidev.net. May 9 2011. *http://www.gmwatch.eu/latest-listing/1-news-items/13132-gm-maize-contaminates-non-gm-crops-in-uruguay*)
- In Canada, there have been numerous reports of GM canola sprouting up where it wasn't planted, and tests found GM genes in more than 50 percent of canola plants. (Studies show gene flow in GM canola likely widespread." Ron Friesen. Manitoba Co-operator, July 4 2002. *http://monsanto.unveiled.info/canada/geneflow.htm*). Similar reports from Japan, the US, and Australia. (Special Report: Genetically Modified Canola Contamination in Japan." Nishoren.org, October 29 2010. *http://www.nishoren.org/en/?p=888)*
- In the US, an estimated 50 percent of maize seeds, 50 percent of cotton seeds, and 80 percent of canola seeds now contain GE DNA, according to a study by the Union of Concernced Scientists. ("The Day the Sun Dies: Contamination and Resistance in Mexico" Silvia Reibeiro. GRAIN.org, July 2004. *http://www.grain.org/seedling/?id=292#_3*)
- In Hawaii, 30-50 percent of papaya was found to be contaminated with GM genes. ("Hawaiian Papaya: GMO Contaminated" Hawaii SEED, 2006. *http://www.grain.org/research_files/ Contamination_Papaya.pdf*)
- In 2004, GE papaya field trials in Thailand were found to be the source of widespread genetic contamination; more was found in 2005 after the Department of Agriculture claimed it had all been eradicated. (*http://www.greenpeace.org/international/en/news/features/ge-papaya-010606/*)
- In 2005, 13,500 tons of maize in New Zealand

were found to be contaminated by GE material during routine testing—the sixth such incident in three years. (*http://www.connectotel.com/gmfood/nz270705.txt*)
- In Japan in 2005, GE crops (corn, soya) were found growing all over ports as a result of seeds being spilled during unloading and transportation. (*http://www.lifeissues.net/writers/mcc/mcc_01 geneticengin.html*).
- A 2004 report found widespread contamination of soya in Brazil. (*http://www.grain.org/research/contamination.cfm?id=164*).

6. Patents on Seeds and Seed Monopolies

GMOs are intimately linked to seed patents. In fact, patenting of seeds is the real reason why industry is promoting GMOs.

Monopolies over seeds are being established through patents, mergers and cross licensing arrangement.

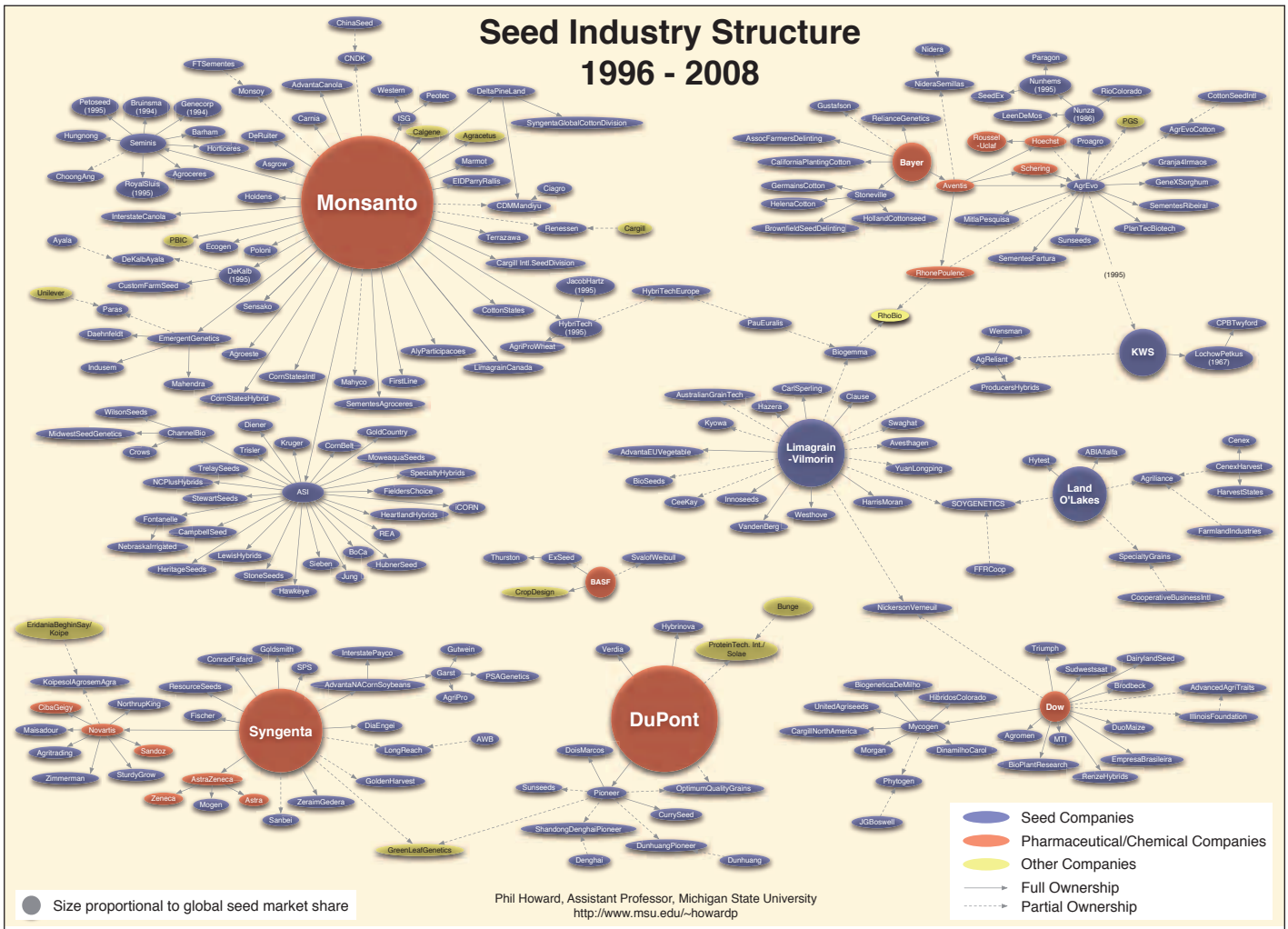
Monsanto now controls the world's biggest seed company, Seminis, which has bought up Peto Seed, Bruinismo, Genecorp, Barhan, Horticere, Agroceres, Royal Suis, Choon Ang, Hungnong. Other seed acquisitions and joint ventures of Monsanto are – Asgrow, De Rinter, Monsoy, FT Sementes, Carma, Advanta Canola, China Seed, CNDK, ISG, Wertern, Protec, Calgene, Deltapine Land, Syngenta Global Cotton Division, Agracetus, Marneot, EID Parry Rallis, CDM Mandiyu, Ciagro, Renessan, Cargill, Terrazawa, Cargill International Seed Division, Hybritech, Jacob Hartz 1995, Agriprowheat, Cotton States, Limagrain Canada, Alypanticipacoes, First line, Mahyco, Corn States Intl, Corn States Hybrid, Agroeste, Seusako, Emergent Genetics, Mahendra, Indusem, Darhnfeldt, Paras, Unilever, Dekelb, Lustum, Farm Seed, Deklbayala, Ayala, Polon, Ecogen, PBIC.

Monsanto has cross-licensing arrangements with BASF, Bayer, Dupont, Sygenta and Dow. They have agreements to share patented genetically engineered seed traits with each other. The giant seed corporations are not competing with each other. They are competing with peasants and farmers over the control of the seed supply.

World's Top Ten Seed Companies

S.No.	Company	2007 Seed Sales (US $ Million)	% of global Propriety seed market
1	Monsanto (US)	$ 4694	23%
2	Dupont (US)	$ 3300	15%
3	Sygenta (Switzerland)	$ 2018	9%
4	Groupe Linagrain (France)	$ 1226	6%
5	Land Olakes (US)	$ 917	4%
6	KWS AG (Germany)	$ 702	3%
7	Bayer Crop (Germany)	$ 524	2%
8	Sahata (Japan)	$ 396	< 2%
9	DLF Trifolum (Denmark)	$ 391	< 2%
10	Takii (Japan)	$ 347	< 2%
	Top 10 Total	$ 14785	67%

(ETC: Who owns Nature http://www.etcgroup.org/upload/publication/707/01/etc_won_report_final_color.pdf).



(Phil Howard, Assistant Professor, Michigan State University – *https://www.msu.edu/~howardp/seedindustry.html)*

The combination of patents, genetic contamination and the spread of monocultures means that society is rapidly losing its seed freedom and food freedom. Farmers are losing their freedom to have seed and grow organic food free of the threat of contamination by GE crops. Citizens are losing their freedom to know what they are eating, and the choice of whether or not to eat GE free food.

An example of seed monopolies is cotton in India. In a decade, Monsanto gained control of 95 percent of the cotton seed market, and seed prices jumped 8,000 percent. India's Anti-Trust Court, the Monopoly and Restrictive Trade Practices Commission, was forced to rule against Monsanto. High costs of seed and chemicals have pushed 250,000 farmers to suicide with most suicides concentrated in the cotton belt. Monsanto does not just control the seed through patents. It also spreads its control through contamination. After spreading genetic contamination, Monsanto sues farmers as "intellectual property thieves" as it did in the case of Percy Schmeiser. That is why a case has been brought against Monsanto by a coalition of more than 80 groups to stop Monsanto from suing farmers after polluting their crops. (*http://www.pubpat.org/assets/files/seed/OSGATA-v-Monsanto-Complaint.pdf)*

Denial of labeling as the denial to consumers of their democratic "Right to Know" and "Right to Choose"

In June 1997, the US Trade Representative Charlene Barshefshy warned the European Union Agriculture Commission Franz Fischler not to go through with proposals to require the labeling of genetically modified organisms (GMOs) or their segregation from regular products. The Trade Representative told the Senate Agriculture Committee that the US cannot tolerate a step which would cause a major disruption in U.S exports to the E.U.

The E.U. Commissioner was under pressure from European Consumers to label GMO foods

as their democratic right to information and choice. However, consumer rights were defined by the US trade representative as "arbitrary, politicized and scientifically unjustified" rules. The insistence of consumers to pursue "non-science based restrictions" would lead to a "trade war of major dimensions."

In a letter to the US Secretary on June 12th, 1997, US agribusiness corporations stated the segregation of crops for labeling is both scientifically unjustified and commercially unfeasible.

According to US industry, labeling of foods violates the WTO agreement on free trade. The Sanitary and Phyto-Sanitary measures in WTO are thus viewed by industry as protecting their interests. But the right to information is about democracy and democratic rights cannot be sanctioned by arbitrary technocratic and corporate decision making about what is 'sound science' and what is not.

The denial of labelling is one dimension of totalitarian structures associated with the introduction of genetic engineering in food and agriculture. Navdanya filed a case in India demanding labeling of GM foods but the direct intervention by the US embassy prevented the labeling law from being introduced by the Indian Health Ministry.

On July 5, 2011 Codex Alimentarius, the international food safety body, recognized the right of countries to label GMO foods. This ended twenty years of an international struggle. As the Consumer International states: "The new Codex agreement means that any country wishing to adopt GM food labeling will no longer face the threat of a legal challenge from the World Trade Organization (WTO). This is because national measures based on Codex guidance or standards cannot be challenged as a barrier to trade."(*http://foodfreedom.wordpress.com/2011/07/05/codex-alimentarius-adopts-labeling-of-genetically-modified-foods/*).

We now need to build on this right-to–know principle and ensure GMO labeling in all countries.

GMOs are an Issue of Food Democracy

This is why GE crops are an issue for democracy. Food democracy is everyone's right and responsibility. We have food democracy when we can exercise our choice to have GMO free seed and food. This choice is being undermined as seed is genetically engineered and patented, as food systems are increasingly controlled by giant corporations, as chemical pollution and genetic pollution spread uncontrolled, making our food unsafe. Each of us must defend our food freedom and urge our governments to protect the rights of their citizens and stop supporting corporate takeover of our seeds and foods. Each of us is vital in creating food democracy. We invite you to join us to defend the most fundamental freedom: our food freedom.

⋆ *Vandana Shiva, distinguished Indian physicist environmentalist, and campaigner for sustainabilitiy and social justice. Director/Founder of The Research Foundation for Science, Technology and Ecology (RFSTE) and Director/Founder of Navdanya. She is the author of numerous books and the recipient of a number of awards, including the Right Livelihood Award and most recently the Sydney Peace Prize.*

II. SYNTHESIS

Debbie Barker*

As the instructive tale of *The Emperor's New Clothes* makes clear, one lone voice speaking the truth can lift the shroud covering untruths and complicity.

This report is a compilation of the many voices from around the globe speaking the truth about what is happening in their communities and countries and are exposing the fable that genetically modified organisms (GMOs) are, as Wendell Berry writes, "the latest answer-to-everything."

GMO advocates claim that biotechnology can ameliorate major challenges of our day, notably food crises, natural resource degradation, and climate chaos associated with global warming. However, as these reports reveal, GMOs have failed to live up to the cure-all claims, and moreover this technology is a continuation of a global industrial agricultural model that has failed to feed the hungry and has contributed to environmental destruction and global warming.

Genetically Modified (GM) — The Way to Food Security?

Genetically modified (GM) seeds and plants have been around almost two decades, yet in this time hunger has reached epic numbers, with more than one billion people going hungry every day. GM advocates often argue that people are going hungry because they will not eat GM food due to scare-mongering tactics of those who campaign for a cautionary approach. "Food insecurity in developing regions such as Africa is partially a result of the anti-GM campaign," said David King, director of the Smith School of Enterprise and the Environment at Oxford University in Britain, during the 15th World Congress of Food Science and Technology.[1]

This people-just-don't-know-what's-good-for-them platitude belies a few important facts. First, the claim that GM crops produce higher yields and therefore will feed the hungry is false. This is well documented by empirical experiences and scientific studies cited in this report. Alongside the yield falsehood, attempts to cultivate GM crops of cassava, yam, and other food staples have failed.

For example, in early 2000 Monsanto-trained scientist, Florence Wambugu, directed a project to create a GM virus-resistant sweet potato to be grown in Kenya. Wambugu traveled the world extolling the virtues of GM crops and the media reported widely about great success of the GM sweet potato even before it was field tested. Forbes magazine reported, "While the West debates the ethics of genetically modified food, Florence Wambugu is using it to feed her country."

While headlines and opinion leaders declared the GM sweet potato to be a triumph, the results of the field trials were quietly published in 2004. Kenya's Daily Nation reported: "Trials to develop a virus resistant sweet potato through biotechnology have failed." Yet, the lore of the GM sweet potato is still repeated as an example of how millions in Africa can be spared from hunger.

[1] http://ipsnews.net/africa/nota.asp?idnews=52641

A second reason why GM crops are not feeding the hungry is because they are feeding animals and cars instead. The overwhelming majority of GM crops are grown for either animal feed or to produce biofuels. In large part, this is because enormous profits can be made from crops that feed into an industrialized model of agriculture. Small-scale, agroecological farm systems that grow food locally for local consumption are systems of self-sufficiency and do not fit into an industrial, market-based paradigm.

Third, GM crops are an extension of the current industrial model that fails to recognize that hunger is fundamentally a problem of poverty, food distribution, and inequity. Even though we currently grow enough food to feed the world, more than one billion people still go hungry. Enough food is available to provide at least 4.3 pounds of food per person per day worldwide: this consists of two and a half pounds of grain, beans, and nuts, about a pound of fruits and vegetables, and nearly another pound of meat, milk, and eggs.[2]

Food security begins with equitable and fair access to land and vital natural resources. The current system of relying on global markets and import/export models has dismantled food security at the household level where it must begin. Agroecological systems provide the multi-functionality and self-reliance that will ensure plentiful and equal access to food and water.

Fourth, proponents of GM seeds and crops either do not realize—or do not acknowledge—that, in contrast to the high-tech, very costly GMO industrial system, there are viable, low-cost farming methods that better guard against hunger and poverty. Vigorous research demonstrates that agroecological, organic methods of farming can produce yields equal to or greater than industrial agriculture yields. "Model estimates indicate that organic methods could produce enough food on a global per capita basis to sustain the current human population, and potentially an even larger population without increasing the agricultural land base," states a report based on a long-term, comprehensive global research project.[3] Based on 293 test cases, the research found that, in developing countries, organic methods produced 80 percent higher yields than industrial farms.[4]

A recent study by the United Nations Special Rapporteur on the Right to Food reported that agroecological systems doubled crop yields over a period of three to 10 years in field tests conducted in 20 African countries.[5] The report also cites numerous other studies confirming high yields and reduced chemical use in other regions of the world due to agroecological farming methods.

Common Threads, Common Visions

Countries and regions discussed in this report each have distinct experiences with GMOs, however, there is a common thread to all of the stories. The main theme is that even though citizens in every country, in poll after poll, clearly express that they do not want GMO products, most government leaders insist on supporting this technology and even work to hasten adoption of GM seeds and crops.

Why are so many governments working to contravene the desires of their citizens? The collusion between governments and biotechnology corporations is manifested through various tactics. Lobbying, marketing, funding science, education, and research institutions, "revolving door" political influence, and blatant disregard for the law are all exposed in these reports. These reports illuminate the omnipresence of the industry.

As noted in the report from the U.S., the leading proponent of GM crops—top food and agricultural biotechnology firms spent more than $547 million lobbying Congress between 1999 and 2009. In addition to lobbying efforts, the biotechnology industry has made more than $22 million in political campaign contributions since 1999.[6]

Additionally, there is a "revolving door" spinning out of control as many former employees of the biotechnology industry are now working

[2] Holly Poole-kavana, 12 Myths About Hunger, backgrounder, 12 (2), oakland: Food First, 2006, http://www.foodfirst.org/sites/www.foodfirst.org/files/pdf/Bg%20SU06%2012%20Myths%20 About%20Hunger.pdf.
[3] Catherine Badgley et al., Organic Agriculture and the Global Food Supply, Cambridge Journals, 9 June 2006, Introduction, doi:10.1017/S1742170507001640.
[4] Ibid.
[5] Olivier De Schutter, Food Commodities Speculation and Food Price Crises, issue brief, Geneva, Switzerland: United Nations, 2010, p. 1-2, http://www.srfood.org/images/stories/pdf/otherdocuments/20102309_briefing_note_02_en.pdf (accessed 18 January 2011).
[6] http://documents.foodandwaterwatch.org/BiotechLobbying-web.pdf

in government posts, or have become official advisors to governments. The regulated are becoming the regulators with predictable results—policies to safeguard the public are being eliminated or ignored. The reports provide numerous illustrations of this revolving door influence.

For example, in Argentina, representatives from biotechnology corporations Monsanto, Syngenta, Bayer, Dow, and Pioneer sit on a prominent national panel that directly advises the government agency that decides about the release applications that these same companies submit.

In the U.S., it is now standard practice for biotechnology firms to employ former members of Congress and Congressional and White House staff to give the industry an inside track. There are many examples of former employees from biotechnology corporations now working in government—a senior advisor to the Food and Drug Administration (FDA) was a former lobbyist for Monsanto, the head of the main research arm for U.S. government agricultural research formerly worked for Danforth Plant Science Center (funded by Monsanto), and a former Monsanto employee is on the government committee tasked with legalizing GM salmon.

Another main reason why many governments are opening the doors to GMOs is because of the far-reaching marketing and advertising influence of the industry.

Just as the weavers in the *Emperor* tale repeatedly assured everyone that they were indeed weaving beautiful garments, biotechnology corporations repeat stories of success over and over again until the message becomes the truth instead of actual experiences and outcomes.

The recent "America's Farmers Grow America" advertising campaign in the U.S. depicts Monsanto as being a friend to farmers and helping to grow the U.S. economy. "We are going to help tell their story. And it's a great story to tell," Monsanto says. But the hundreds of farmers being sued by Monsanto for alleged patent infringement and violation of technology user agreements might have a different story to tell.

In India, Monsanto's advertising slogan is: "India delights as cotton farmers' lives transform for the better." But the widows of the more than 250,000 farmer suicides in India related to GM cotton crop failures are certainly not delighting.

Marketing influences also include more subtle methods that include dispatching industry representatives to speak at everything from book fairs to private investor gatherings to a host of conferences for "future leaders," "innovators of tomorrow." An example from Australia details marketing that goes far beyond subtle. In response to a moratoria on the sale of GM seed by some state governments, the industry quickly countered and developed a touring workshop geared for corporate executives entitled, "How to Beat Activists at Their Own Game." At one of the workshops, a speaker advised participants to "Take the moral high ground. …Tell politicians that when they support biotechnology they are demonstrating much needed moral and political leadership. Conversely, you may want to point out the immorality of those who oppose biotechnology."

Contamination/Illegal Plantings

As many of country reports note, GM seeds and crops frequently enter into regions via illegal plantings. In many instances, the biotechnology industry has simply ignored laws that prohibit GMOs, or GM seeds and plants are distributed to farmers via underground markets. Contamination is another vehicle for spreading GMOs. The similar experience in many countries is that once GMOs are found in a country—whether via contamination or illegal plantings—governments often use this to justify legalizing GM seeds and crops.

In the report on India, Dr. Vandana Shiva sums up the experience of India that is repeated in country after country. "Either Monsanto blatantly violates the laws, or it has laws changed through its influence. It changes policies to privatise the seed and make farmers dependent on its seed monopoly. It corrupts governments and policymakers. It corrupts knowledge and science. It corrupts biodiversity through genetic contamination and genetic pollution."

Crop Failures/Effects on Farmers

Another common refrain throughout the reports is that governments and industry promise farmers higher profits if they convert to GM seeds and crops, yet farmers are left on their own when failures come.

This is the situation of Bt cotton's introduction in South Africa's Makhatini Flats. After five years, the majority of farmers growing Bt cotton are in debt and the number of farmers still growing the GM cotton has reduced by 80 percent.

Similarly, Conalgodón, the Colombian federation

of the cotton growers, has been seeking damages from Monsanto for cotton seed that failed to resist a plague to cotton plants as promised. Despite Monsanto assurances to farmers that they would be compensated for any potential losses when they approached farmers to switch to the GM cotton seed, Monsanto has still not provided damage payments.[7]

In the India report, the full story of farmer suicides related to the adoption of Bt cotton is told. Though the biotechnology industry has denied any correlation between the suicides and the introduction of GM cotton, this report documents that the suicides take on an epidemic proportion precisely when Monsanto began its illegal trials of the cotton and continue as Bt cotton is commercialized.

Environmental Consequence — More Pesticides, Emerging Super Weeds and Super Insects

Countries that have widely adopted GM technology are united in their reports of environmental harms caused by GM crops.

The U.S. Department of Agriculture (USDA) data, found that GM crops in the U.S. used more than 26 percent more pesticides per acre than non-GM, conventional crops.[8] In Argentina, the use of agrochemicals increased from 30 to 270 million liters between 1996 and 2007. Herbicide imports increased 330 percent with the introduction of GM soy. As compared to use on traditional fields, 9.1 million kilograms more of herbicides were used in GM soy plantations in 2001 alone.

Agronomists around the world are alarmed by the growing epidemic of herbicide-resistant weeds, also known as superweeds, that have evolved resistance to glyphosate as a result of the intensive use of this herbicide.[9] From November 2007 to January 2011, the number of reports of confirmed glyphosate-resistant weeds in the U.S. nearly doubled from 34 to 66. Infested acreage more than quintupled, from 2.4 to 12.6 million acres. (According to aggregated data from the USDA).

In Brazil, researchers have reported that some weeds have developed tolerance to glyphosate in nine species, four of which are weeds that can cause serious problems to crops[10,11].

As superweeds continue to spread, Btresistant super insects are emerging. Rootworms are developing a resistance to Monsanto's Bt corn in Iowa and Illinois. And, Monsanto has finally acknowledged that a bollworm pest has developed resistance to its Bt cotton in India.

The monoculture practice of GM farming is contributing to loss of biodiversity, global warming, and loss of tribal and indigenous lands. For example, each year, more than 200,000 hectares of native forests in Argentina are deforested as a result of the expansion of the agricultural frontier, mainly the expansion of soy monoculture plantations.

Trade/Policy Influence

Critiques or analyses of food systems sometimes do not fully incorporate the broad impacts of trade and economic policies and agreements.

For example, during negotiations for the Russian Federation's accession to the World Trade Organization (WTO), multinational biotechnology firms, along with the U.S. government, lobbied Russian officials to accept a special agreement on biotechnology that would eliminate the country's current GMO labeling laws and extend special allowances to U.S. biotechnology firms for their intellectual property rights pertaining to GM seeds and crops.

Prior to enacting economic reforms to comply with WTO rules (e.g., lifting "barriers" to allow investments by foreign firms), public sector breeding dominated the cotton seed market in India. Today, the bulk of value is now accounted for by private seed firms. India is the second largest producer of cotton, one of the world's most widely traded commodities. Yet—due

[7] (http://colombiareports.com/colombia-news/economy/4472-colombian-cotton-growers-want-to-sue-monsanto.html).
[8] Dr. Charles Benbrook, Impacts of Genetically Engineered Crops on Pesticide Use in the United States: The First Thirteen Years," The Organic Center, Nov. 2009, p. 47 & Supplemental Table 7, http://www.organic-center.org/science.pest.php?action=view&report_id=159.
[9] S.B. Powles (2010). "Gene amplification delivers glyphosate-resistant weed evolution," Proceedings of the National Academy of Science 107: 955-56.
[10] Review of potential environmental impacts of transgenic glyphosate-resistant soybean in Brazil. Cerdeira et al, 2007, available at: http://www.informaworld.com/smpp/content~content=a779480992.
[11] Buva "transgênica" resiste ao glifosato. Gazeta do Povo, December 1st, 2009.
http://portal.rpc.com.br/jm/online/conteudo.phtml?tl%3D1%26id%3D950000%26tit%3DBuva-transgenica-resiste-ao-glifosato.

to trade barriers being lifted — between 1997 and 98 and 2004 and 2005, India imported 115 lakh bales, more than three times the amount imported in the preceding 25 years.

Discrediting Scientists Opposing GMOs

Another repeated story told in these reports is one of scientists being discredited, and in some cases, dismissed from their jobs, when they speak out about GMOs. Often when these scientists begin GM-related research, they are not opposed to the technology. But their findings reveal reasons to be concerned about the impact of GMOs on food safety, public health, and the environment.

Dr. Arpad Pusztai, a world renowned scientist, was one of the first victims of a smear campaign that eventually resulted in him being forced to leave his post as director of the Rowett Research Institute. In 1997, Dr. Pusztai and his wife and colleague, Dr. Susan Bardocz, carried out the first nutrition and toxicological study on GMOs. When he fed GM potatoes to lab rats, he found that the organs of the rats became critically damaged and their immune systems were severely weakened. Days after an interview with the BBC News in which he discussed his findings his laboratory notes were confiscated and he was dismissed from his post. Dr. Pusztai revealed that the emperor had no clothes, but many were not ready to hear this news.

Similarly, Andrés Carrasco, a very well-known and respected professor of embryology at the Medicine School in the Buenos Aires University, undertook research that showed a lethal effect of glyphosate on amphibian embryos. Carrasco was met with a flurry of accusations by agribusiness, politicians, some media, and others that his findings were flawed. However, in this case a happier ending ensued. After careful review of his science, some provincial laws were enacted to regulate the use of glyphosate.

But, the usual response to science that contradicts safety claims of the biotech industry is retaliatory. Often corporations providing research funds for universities and institutes threaten to withdraw funds if any research on GMOs counters their claims of high yields, reduced pesticide usage, product safety, or other claims. Such threats obviously serve as a "chilling effect" and can limit the scope of science and research.

Warnings From Scientists

Many emerging scientific studies are demonstrating that GM technology can cause potential serious harms to human health and food safety, the environment, biodiversity of both plants and living creatures. This publication contains reports from scientists who are sounding the alarm on these troubling aspects of GMOs.

David Suzuki, a geneticist by training, reminds us that throughout history technologies have been too frequently advanced without full review. As one example, in Nazi Germany, geneticist Josef Mengele held peer-reviewed research grants for his work at Auschwitz. Suzuki empasizes that societies should apply the Precautionary Principle with any new technology and ask whether it is needed and then demand proof that it is not harmful. Nowhere is this more important than in biotechnology because it enables us to tamper with the very blueprint of life.

GMOs have been released without a complete assessment of their effect on public health and the environment. And, as learned from past experiences, anyone entering an experiment should give informed consent. Suzuki concludes, "That means at the very least food should be labeled if it contains GMOs so we each can make that choice".

Scientist Mae Won Ho reports that researchers at Bristol University have discovered a new phenomenon of horizontal gene transfer. That is, the spread of GM genes by infection and multiplication (via a virus) regardless of species barriers is occuring at a rapid pace.

"New combinations of genetic material are created at unprecedented speed, affecting species the most that reproduce the fastest," she reports. Won Ho provides great technical expertise and scientific information detailing this frightening scenario. Emphasizing that this could be the most serious hidden and underestimated hazard of GMOs, she calls for a global ban on further environmental releases of GMOs.

Hans Herren outlines how the 60-year history of industrial agriculture's toxic treadmill of using ever more potent chemicals has damaged soils, watersheds, biodiversity, as well as farmer livelihoods. Herren stresses that this damaging legacy should serve as a lesson and provide impetus for transitioning to farming without chemicals. However, instead societies are increasingly repeating past mistakes by turning to GM seeds and plants. As weeds and pests are increasingly building up resistance to the chemicals used on GM plants, the use of pesticides has increased greatly. Herren also notes

that GM plants have failed to deliver increased yields and have been unsuccessful in delivering any "climate ready" traits. He advocates for farming practices that build healthy soils which, in turn, require less water and use less energy than than industrial, chemical-ridden soils.

Bill Freese discusses how the use of glyphosate for weed control is largely responsible for a ten-fold increase in agricultural use of the herbicide in the U.S. from 1993 to 2007.[12] At 200 million pounds per year in the U.S. alone (2007),[13] glyphosate is the most heavily used pesticide the world has ever seen. Freese points out that glyphosate formulations are clearly harmful to the environment and may pose human health risks as well. He cites epidemiological studies of farmers that have shown an association between contact with glyphosate herbicides and higher rates of certain cancers – non-Hodgkin's lymphoma, hairy cell leukemia[14] and multiple myeloma.[15] He also explores increasing contamination of GM crops to non-GM crops and has also generated an epidemic of glyphosate-resistant weeds.

Former Managing Director of Monsanto, India, Dr. T.V. Jagadisan, writes of Monsanto's cloak and dagger business dealings in India and of the company's aim to control India's agriculture by controlling the country's seed business through its wholly-owned Indian subsidiary Mahyco. He points out that many more long term trials need to be carried out by independent agencies and cautions against the scientific community rushing into GM technology under the false claim of increasing production without understanding the true consequences.

In the section on the History of Monsanto, dintinguished Indian scientist, architect of molecular biology and biotechnology in India, Dr. P. M. Bhargava, gives a detailed account of Monsanto's violations, including fraud, false reporting, harassment and intimidation, bribing officials and in one extreme case withholding of evidence about the safety of their PCBs to residents which resulted in a court finding Monsanto guilty on six counts of negligence, wantoness and suppression of the truth, nuisance, trespass and outrage.

In addition to articles by these well regarded scientists, many country-specific reports provide information on GMO scientific research demonstrating many potential harms to humans and nature from this technology.

Movements and Resistance

As these reports show, civil society movements within countries and working in global solidarity continue to expose the falsehoods of GM technology. Civil society—including farmer, environmental, consumer, unions, public health and social justice groups—actions range from direct actions such as uprooting GM crops to policy and public outreach projects such as GMO-Freeze campaigns and GMO labeling initiatives. In addition, many regional governments also initiate actions and policies to halt GMOs. Networks of scientists—notably the European Network of European Scientists for Social and Environmental Responsibility, along with the Union of Concerned Scientists (U.S. based)—provide critical technical information for civil society and governments alike.

Some groups are undertaking legal actions. A few examples include: Biowatch South Africa's challenge against Monsanto over the right to access of information about biosafety and location of several GM crop field trials: numerous legal trials in the U.S. led by the Center for Food Safety to halt or challenge commercialization of GM alfalfa, GM sugar beets, and other GM crops. In India, Navdanya has been challenging companies for stealing seed knowledge and technical development from indigenous, tribal peoples—also known as biopiracy.

[12] U.S. Environmental Protection Agency, "Pesticides Industry Sales and Usage: Market Estimates" – see reports for 1998/1999 and 2006/2007, Table 3.6 in each report, http://www.epa.gov/opp00001/pestsales/. Agricultural use of glyphosate rose from 15-20 million lbs. in 1993 to 180-185 million lbs. in 2007.

[13] Ibid, 2006/2007 report. Agricultural use (180-185 million lbs) + home/garden use (5-8 million) + industrial/government/commercial use (13-15 million) = 198-208 million lbs. total (Tables 3.6 to 3.8).

[14] Hardell, L., & Eriksson, M. (1999). "A Case-Controlled Study of Non-Hodgkin's Lymphoma and Exposure to Pesticides," Cancer, 85(6), 1353–1360; Hardell L, Eriksson M, & Nordstrom M. (2002). "Exposure to pesticides as risk factor for non-Hodgkin's lymphoma and hairy cell leukemia: pooled analysis of two Swedish case-control studies," Leuk Lymphoma, 43(5), 1043-1049; De Roos, et al. (2003). "Integrative assessment of multiple pesticides as risk factors for non-Hodgkin's lymphoma among men," Occup Environ Med, 60(9).

[15] De Roos, A. J. D., Blair, A., Rusiecki, J. A., Hoppin, J. A., Svec, M., Dosemeci, M., Sandler, D. P., & Alavanja, MC (2005). Cancer Incidence among Glyphosate Exposed Pesticide Applicators in the Agricultural Health Study. Environmental Health Perspectives, 113(1), 49-54.

The Way Forward—Agroecological Farming
Many reports discuss alternative farming practices that protect the environment, sustain livelihoods and rural communities, and provide food security. In Indonesia, when restrictions were introduced on the use of 57 pesticides used in growing rice and subsidies for pesticides were eliminated, the volume of pesticides used on rice fell by more than 50 percent and yields increased by about 15 percent. Farmers' net incomes increased by $18 per farmer per season. The government saved $120 million per year by ending pesticide subsidies.[16]

In Bangladesh the "No Pest" program led to pesticide reduction of 76 percent and yield increases of 11 percent. Returns increased by an average of 106 percent in the dry season and 26 percent in the wet season.[17]

Other examples of successful agroecological, organic practices are found throughout the report from the planet.

Regional and Country Specific Reports
The following extracts highlights taken from country/regional reports. The full reports can be found at: www.navdanyainternational.it.

We highly encourage you to read the full reports as this synthesis only provides a glimpse into the powerful testimony and actions of civil society movements from every part of the world.

Voices from the Americas
Canada
Canada ranks number five in the world in total acreage under GM cultivation. Principle GM crops in Canada are canola, soy, and corn. Approximately 90 percent of all canola grown in the country is GM; and almost 65 percent of soy and corn are GM.

The U.S. is Canada's largest canola buyer. The U.S. imported an average of 510,000 tons of canola oil per year from 2000-2001 to 2004-2005, valued at $345 million/year. Canada's principal seed buyers are Japan and Mexico. China and Pakistan are also emerging as major seed buyers.

The ordeal of Percy and Louise Schmeiser, summarized in this report, is an illustration of the depth and breadth of a patenting system that strips away farmers' rights and ability to save seed. The Schmeisers, Canadian canola farmers and seed savers, were sued by Monsanto in 1996 after their fields became contaminated by GM canola. Monsanto charged that the Schmeisers owed Monsanto profits from their canola crop as well as technology fees because GM canola was found on their farm. Monsanto also asked for a million dollars in court costs.

Astonishingly, even though the Supreme Court of Canada acknowledged that the GM canola found on the Schmeisers' property was clearly the result of contamination from a neighboring farm, the Court ruled that patented GM crops are a corporation's property regardless of how the GM material spreads to another property. This ruling is an example of the perverse logic that allows corporations to claim that GM seeds and crops are "novel" and therefore can claim patent rights while simultaneously allowing corporations to claim that GM seeds and crops are substantially equivalent (i.e., not novel) when GM crops contaminate non-GM crops.

U.S.
As an early adopter of technologies involving genetic manipulation, and the largest grower of genetically modified (GM) crops (almost half of the global total), the U.S. experience is a particularly instructive example regarding the benefits versus hazards of this technology.

GM crops have been commercially grown in the U.S. since the mid-1990s without undergoing any independent testing on potential effects on public health, food safety, the environment, or on the livelihoods of farmers and economies of rural communities. As of 2009, 93 percent of soybeans, 93 percent of cotton, 80 percent of corn, and approximately 62 percent of canola, and 95 percent of sugar beets grown are GM crops.[18]

It has been estimated that approximately 70 percent of processed foods on supermarket shelves in the U.S.– from soda to soup, crackers to condiments – contain GM ingredients. Yet, there is no labeling of foods containing GMOs. There are upcoming initiatives in several states to require labeling.

Pesticide usage has increased with the advent of

[16] (Thrupp, 'New Partnerships for Sustainable Agriculture', 1997)
[17] Ibid.
[18] http://www.ers.usda.gov/Data/BiotechCrops/

GM crops. The USDA data found that GM crops in the U.S. used more than 26 percent more pesticides per acre than non-GM, conventional crops.[19] GM crops increased pesticide usage in the U.S. by 318.4 million pounds from 1996-2008.[20]

Much of the pesticide increase can be ascribed to the need to use more pesticides in an attempt to get rid of weeds that over generations have become resistant to glyphosate. From November 2007 to January 2011, the number of reports of confirmed glyphosate-resistant weeds, also known as "superweeds" in the U.S. nearly doubled from 34 to 66. Invested acreage more than quintupled, from 2.4 to 12.6 million acres. (According to aggregated data from the USDA.)

On the federal level, eight agencies attempt to regulate biotechnology using 12 different statutes or laws that were written long before GM food, animals and insects became a reality. The result has been a regulatory tangle. The U.S. Congress has yet to pass a single law intended to manage GMOs. In many ways, the Obama Administration promotes GM crops more vigorously than previous administrations. The Administration views GM crops to be part of its strategy for reducing world hunger.

In May 2011, the USDA approved a corn variety genetically engineered to resist drought. The corn was developed by a Monsanto and BASF partnership. However, the USDA's draft environmental assessment noted that the GM corn does not seem to display any traits of drought resistance that are superior to many non-GM corn varieties.

The recent deregulation of GM alfalfa was approved even though the USDA's environmental impact statement for GM alfalfa admits that gene flow between GM and non-GM alfalfa is "probable."

There are ongoing legal actions that include challenging the recent commercialization of GM alfalfa and plantings of GM sugar beets and halting cultivation of GM crops on public lands, to name a few.

Mexico

The debate over GMOs in Mexico centers around maize, or corn, as this is the core of peasant agricultural production and organization, the staple of the popular diet, and the heart of the culture. Maize is the legacy of the country's ancestors. In Mesoamerican creation stories, the human race was modeled out of cornmeal. Mexico the center of origin, diversity, and domestication of this grain and has more than 60 landraces and thousands of native varieties.

The demise of maize in Mexico began with the passage of the North American Free Trade Agreement (NAFTA) which eliminated most trade "barriers" between the U.S., Mexico, and Canada. NAFTA, which took effect in 1994, resulted in massive imports of artificially cheap, subsidized corn from the U.S. This dramatically reduced maize farmer livelihoods in Mexico and dismantled rural economies. It also provided a gateway for GM corn. As a result, corn imports from the United States increased three-fold after NAFTA, prices dropped by 50 percent, and 3.2 million producers, the majority of Mexico's small-scale producers found themselves under increasing economic pressure.[21]

In 1999, scientists of the National Council of Agricultural Biosecurity helped to establish a de facto moratorium on experimental and commercial cultivation of GM corn in Mexico. A report issued at the 2002 Conference of Pugwash, concluded that "our current knowledge is insufficient to evaluate the risks and benefits of GMOs, particularly in light of the short and long term consequences that these technologies could imply for the biosphere and future generations." A major concern was that GM corn could contaminate Mexican landraces and varieties.

In 2001, scientists from the University of California at Berkeley, Ignacio Chapela and David Quist, found that native corn varieties had been contaminated with transgenes from GM corn. The source of contamination was from U.S. corn imports, of which the majority was GM corn. (Mexico is the second largest export market for U.S. corn.)

The 2005 Biosecurity and Genetically Modified Organisms Law, often referred to as the "Monsanto Law," established three steps toward

[19] Dr. Charles Benbrook, Impacts of Genetically Engineered Crops on Pesticide Use in the United States: The First Thirteen Years," The Organic Center, Nov. 2009, p. 47 & Supplemental Table 7, http://www.organic-center.org/science.pest.php?action=view&report_id=159.
[20] Benbrook, op. cit., p. 3.
[21] De Ita Ana, Fourteen Years of NAFTA and the Tortilla Crisis, Americas Program Special Report, January 2008.

commercialization: 1) experimental cultivation; 2) pilot project; and 3) permit for commercial cultivation.

In 2007, the Law of the Seeds was passed which prohibits marketing, distributing, and exchanging non-commercial seeds. This is an assault on the traditional knowledge and technologies of peasant farmers across Mexico.
In 2009, Mexican President Felipe Calderon lifted a de facto moratorium (in place since 1999) on commercialization of GM corn. The policy to fully commercialize GM corn came shortly after a meeting between President Calderon and the president of Monsanto at the World Economic Forum in Davos, Switzerland. Between 2009 and March 2011, biotechnology companies applied for more than 110 permits to plant GM corn in Mexico. Of these, 67 have been approved for experimental cultivation. The Mexican Ministry of Agriculture issued the first permit for a pilot planting of GM corn to Monsanto in 2011.

The end of the moratorium on GM corn led to the strengthening of civil society. The Network in Defense of Maize, consisting of many farmer, grassroots, scientists, and indigenous organizations, issued a declaration—No to GM Maize in Mexico!—which was signed by 769 organizations and thousands of individuals from 56 countries.

Other GM crops have been plated in Mexico, beginning with GM cotton in 1995. GM cotton covers the greatest land area of all GM crops in Mexico and is located in nine northern states. As cotton is native to Mexico and has been cultivated for centuries, many are concerned about contamination of native cotton varieties. Approximately 83,799 hectares have been authorized to Monsanto for GM cotton production. Between 1998 and 2001, the Mexican government paid Monsanto 45 percent of the value of GM cotton inputs (i.e., seeds and royalty fees).

Latin America
Brazil is the second largest producer of GM crops in the world (approximately 25 million hectares planted with GM crops). Argentina is a close third with approximately 21 million hectares devoted to GM crops. Soybeans comprise the majority of GM crops. The large majority of GM soy crops are glyphosate-tolerant, also known as Roundup Ready (RR) crops.

Currently, in the Southern Cone (Argentina, Brazil, Uruguay, Paraguay and Bolivia) there are three GM crops: soy, maize and cotton planted in approximately 46 million hectares,which represent a third of the total area planted with GM crops in the world.

Soybeans: In Brazil, approximately 70 percent, or 16.5 million hectares, of soy crops planted in 2009/2010 were GM.[22]
In Argentina, almost all of the 18.3 million hectares of soy planted in 2010 were GM.[23]
In Uruguay, soybean crops covered 860,000 hectares (more than 85 percent of the area planted with summer crops), and almost all of it was genetically modified[24]. In Bolivia, 80 percent of the 631,500 hectares of soy were GM[25]. And in Paraguay, GM soy is planted on 2.2 million hectares (representing 60 percent of total hectares under soybean cultivation).[26,27].

Maize: In 2009/2010, about 4 million hectares were planted in Brazil.28. In Argentina, 3.7 million hectares of maize were planted, of which 2.7 million were planted with GM maize.[29]
And in Uruguay, 80 percent of the 90 thousand hectares of maize were GM[30].

Cotton: Argentina is the largest grower of GM cotton within the Southern Cone with the majority of approximately 490,000 hectares planted

[22] Article published in Gazeta do Povo, available at: http://www.gazetadopovo.com.br/blog/expedicaosafra/.
[23] Information from the Agricultural Information Integrated System available at: http://www.siia.gov.ar/index.php/series-por-tema/agricultura.
[24] Agricultural Poll –Winter of 2010. Agricultural Statistics Department, Ministry of Livestock, Agriculture and Fisheries. Uruguay, available at: http://www.mgap.gub.uy/portal/hgxpp001.aspx?7,5,27,O,S,0,MNU;E;27;6;MNU.
[25] http://www.anapobolivia.org/documento/doc_2011.02.09_221234.pdf.
[26] http://www.mag.gov.py/dgp/DIAGNOSTICO%20DE%20RUBROS%20AGRICOLAS%201991%202008.pdf.
[27] http://www.mag.gov.py/index.php?pag=not_ver.php&idx=134310.
[28] Information available at: http://www.cib.org.br/estatisticas.php.
[29] Information available at: http://www.argenbio.org/adc/uploads/imagenes_doc/planta_stransgenicas/TablaArgentinaOGM.ppt.
[30] Agricultural Poll –Winter of 2010. Agricultural Statistics Department, Ministry of Livestock, Agriculture and Fisheries. Uruguay, available at:http://www.mgap.gub.uy/portal/hgxpp001.aspx?7,5,27,O,S,0,MNU;E;27;6;MNU.

with GM.[31] In Brazil, GM cotton represented a small portion of total plantings in 2009/2010.[32]

Generally, the governments of the region, especially in Brazil, Argentina and Uruguay, have facilitated the introduction of GM crops by adapting their regulatory frameworks and basing their risks assessments on the information provided by the biotechnology industry.

Authorization for GM soy was first granted by governments in Argentina and Uruguay in 1996. Monsanto went forward with GM plantings in 2004/2005 in Brazil despite not receiving the proper authority to do so by the government. Instead of controlling and punishing those who have illegally introduced these crops into the countries, government officials have adapted their regulations to allow GM crops and often argue that because the crops already exist, they should be authorized. Today in Brazil, the authorization for approval of GM crops is under the purview of a 2005 Biosafety Law that has left decision making on GMOs to a technical committee, CTNBio. This committee is comprised of a handful of scientists, many with connections to biotechnology companies.[33] All applications for commercial release if GM crops in Brazil have been approved since 2005 as a result of the change to the approval process.

Between 1996 and 2007, the use of agrochemicals increased from 30 to 270 million liters. Herbicide imports increased 330 percent with the introduction of GM soy. As compared to use on traditional fields, 9.1 million kilograms more of herbicides were used in genetically modified soy plantations in 2001 alone.

Super weeds are emerging as a result of massive application of glyphosate[34]. In Brazil, researchers have reported that some weeds have developed tolerance to glyphosate in nine species, four of which are weeds that can cause serious problems to crops[35,36]. Over 30 million liters of glyphosate was sold in 1991, 8.2 million in 1995, to over 30 million in 1997. In 2008 between 160 and 180 million liters of glyphosate were used.

In Argentina, deforestation increased almost by 42 percent as a result of the expansion of the agricultural frontier, mainly the expansion of soy monoculture plantations. Complete habitats have been lost. Some calculations assess that in the past 30 years, Argentina has lost 70 percent of its native forests.

The high use of glyphosate has had grave implications for soil, air, water, and public health. In Argentina, health networks of Doctors in Sprayed Towns of Argentina have documented links between the increase of agrochemical use and increasing rates of cancer, miscarriages, fetal malformations and respiratory conditions, among other impacts.[37]

Voices from Europe

European Union

Almost no GM crops exist in the European Union (EU). Spain is the country with the highest amount of GM crops—70,000 hectares (out of 182 million hectares of agricultural lands) are planted with mainly GM corn. Other European countries that have planted GM crops include: Czech Republic—3,000 hectares and Portugal—500 hectares. Germany, the UK, and a few other countries have very small amounts of land growing GM crops.

Only two GMO events are presently approved for cultivation within the EU: Monsanto's "Mon-810" insecticidal maize, and a potato "Amflora" of BASF, Germany, which is supposed to ease starch processing for industrial use and presently accounts for 2 ha in Germany. "Mon 810", though officially approved by the Union, has since been banned for cultivation by Germany, Austria, France, Greece, Luxembourg,

[31] Information available at: http://www.argenbio.org/adc/uploads/imagenes_doc/planta_stransgenicas/TablaArgentinaOGM.ppt.

[32] Information available at: http://www.cib.org.br/estatisticas.php

[33] A ciência segundo a CTNBio. Revist Sem Terra Nº 53, November 2009, available at: http://boletimtransgenicos.mkt9.com/registra_clique.php?id=H|65072|15226|8993&url=http://www.mst.org.br/sites/default/files/A_ciencia_segundo_a_CTNBio_REVISTASEMTERRA.pdf.

[34] Argentina: las consecuencias inevitables de un modelo genocida y ecocida. Biodiversidad sustento y culturas Magazine, August 2009, available at: http://www.biodiversidadla.org/content/view/full/50874

[35] Review of potential environmental impacts of transgenic glyphosate-resistant soybean in Brazil. Cerdeira et al, 2007, available at: http://www.informaworld.com/smpp/content~content=a779480992.

[36] Buva "transgênica" resiste ao glifosato. Gazeta do Povo, December 1st, 2009. http://portal.rpc.com.br/jm/online/conteudo.phtml?tl%3D1%26id%3D950000%26tit%3DBuva-transgenica-resiste-ao-glifosato.

[37] http://www.reduas.fcm.unc.edu.ar/declaracion-del-2%C2%BA-encuentro-de-medicos-de-pueblos-fumigados/.

Poland, Bulgaria while Italy's GMO legislation at this moment does not allow for any cultivation of GMOs.

Although there is little GM cultivation, the EU imports around 70 percent of its animal feed, most of which is GM soy and corn from the U.S.

When GMOs were introduced in Europe in the late 1990s, consumers overwhelming rejected them. Ninety-five percent of Europeans wanted GM food labeled as such, and 65 percent indicated that they did not want them in their food at all. Still today, public opposition to GMOs remains strong.

After initial approvals for GM crops, mainly Bt corn, public protests forced a moratorium on approvals of GMOs which lasted until 2004. Since that time, several GMOs have been approved for use as food and feed. Food products containing or derived from GMOs fall under EU mandatory labeling laws; however, animal products produced with GMOs do not need to be labeled. This means that milk, eggs, poultry, and other such animal products do not have to be labeled as GMO even though animals may have been fed GM grains (as noted already, GM grains are imported from the U.S.).

In 2003, a European Food Safety Authority (EFSA) was established as a centralized system to analyze risk assessments of GMOs. Legitimacy of this panel has been questioned by civil society movements and the public as the panel consists of GMO proponents and it relies solely on biotechnology industry studies when assessing risks of GMOs.

The European Commission continues to grapple with GMOs and attempts to balance policy between industry pressure and public opinion. The biotechnology industry is exerting heavy influence with government leaders through the creation of the international lobby, International Life and Science Institute, and the ad-hoc group IFBIC, which is comprised of Monsanto, Bayer, BASF, Pioneer, and DuPont.

The need to create new energy sources opens a potential new GMO frontier in Europe. Highly subsidized fuel and energy production have triggered massive investments by industrial operators and institutional investors in agricultural industries and land. This is displacing family farmers and replacing food crops with fuel crops.

In addition to strong country and regional civil society campaigns against GMOs, regional governments have banded together via the Network of European GMO Free Regions. More than 50 regions have joined this Network. In addition to strong civil society and governmental regional networks, the Network of Independent Scientific Labs was created to provide technical – scientific sharing of acquired knowledge.

Specific Countries in Europe

France

From the time that Monsanto's MON 810 corn was put on the European market in 1998, farmers and citizens in France have fought a fierce battle to prevent GMOs from entering their country and from entering Europe. High profile acts of civil disobedience, in some cases resulting in the jailing of leading activists, made the debate on biotechnology a national issue, occupying centre-stage of social and political public debates both in France and Europe. In many other European countries, similar anti-GMO demonstrations were undertaken by activists representing farmers' unions, environmental protection groups and consumer movements.

The European network of regions opposed to GMOs created in 2005 gave a new democratic legitimacy to the fight. In 2008, after a ten-day hunger strike, the government of France declared a moratorium on the cultivation of Monsanto's MON 810, to date the only GM variety authorized in Europe. However the fight goes on as in early September 2011, the Luxembourg-based European Court of Justice, Europe's highest court, declared that France acted illegally when it imposed this ban as it had based its decision on the wrong EU legislation. In reaction to the ruling, France said its embargo on MON810 maize was still valid and that it would restart a procedure if needed.

Germany

In 2005 a first European Conference of GMO free Regions was held in Berlin, Germany. Some 200 representatives from NGOs as well as regional governments, farmer unions, science and some GMO free industries attended the meeting and adopted a "Berlin Manifesto" claiming their right to decide whether or not GMOs would be planted in their region. A few months before more than a dozen regional governments had adopted a "Declaration of Florence" demanding the same right and forming a network of FMO-free regional governments which has now grown to 55 governments and will soon welcome an additional 6 states from Germany.

Italy

Almost all regions in Italy have stood up against GM crop cultivation and, these regions have played a fundamental role in Europe in respect to regulations related to GM crop cultivation. In 2000, Tuscany was the first region to adopt a law, which prohibited the cultivation of transgenic crops in its territory. As an anti-GMO leader in Italy, and throughout Europe, Tuscany instituted several international initiatives, such as the European Network of GMO-free Regions and Local Authorities and the International Commission for the Future of Food and Agriculture. In 2005, 20 regions met in Florence and signed the *Bill of Regions and Local European Authorities on the issue of coexistence between GMOs, conventional and organic agriculture*, also known as the "Florence Bill," which identified a number of fundamental principles for governmental action on the issue of GMOs. Today, 55 regions are members of the European Network of GMO free Regions. In Italy civil society groups have also strongly reacted to the expropriation of their food rights. An alliance between social and economic organizations and a heterogeneous majority, held a national consultation on GMOs in which citizens were able to obtain information and express their preference, which not surprisingly opposed GMOs.

Norway

Although there is no legal commercial production of GMOs in Norway, its National Pension Fund invests in Monsanto. Youth-led civil society groups in Norway are engaged in a campaign calling on the finance minister to divest investments in Monsanto.

Poland

Poland retains a large peasant farming tradition of some 1.4 million small family farms that work mostly on a subsistence level. Then there is a tranche of medium- sized traditional farms and an area of large-scale monocultures. Some 2 million farmers comprise the total on farm work force.

Poland emerged into the 21st century with a reasonably robust legal act to prevent indiscriminate planting of GM seeds/crops. However, as the 2004 date of Polish entry into the EU approached, the pressure to adopt GM plants gathered momentum. Pro-GM trade representatives from the U.S. Department of Agriculture visited Poland frequently and the U.S. Embassy in Warsaw became the quasi headquarters of pro-GM lobbying activities, with close ties to the Monsanto corporation. Cargill mounted a similar offensive on the GM animal feed front and used advertising on U.S. television to depict Polish peasant farmers as an outdated, poor but romantic underclass in need of Cargill's generosity in supplying "cheap" nitrates to make them competitive.

In order to counteract the intense GM propaganda machine, civil society worked with regional governments, many of which created GMO free regions. In 2006, Prime Minister Kaczynski responded by banning the import and planting of GM seeds and banning GM animal feed. Poland thus became the first Country in Europe to enact such a ban. In 2007 a new government was elected and from this time forward, Poland is more sympathetic to accepting GMOs. Civil society has managed thus far to "hold the line" on GMOs.

Russia

Polls show that Russian society is largely opposed to GMOs with 86 percent expressing disapproval of allowing any breeding of GM seeds or crops and 73 percent are against having GMOs in food. There is a robust anti-GMO movement in Russia consisting of environmental groups, scientists, farmers, health professionals, consumers, and more.

Russian legislation does not directly prohibit the breeding of GMOs. There are procedure to permit such breeding in the Russian Federation through environmental and biological safety tests by certified scientific institutions, by the Commission of State Environmental Expertise and final consideration by the Ministry of natural resources and environment. No permit has yet been granted.

Representatives of the U.S. government and multinational biotechnology corporations strongly advocate for GMOs in Russia. During negotiations for Russia's accession to the World Trade Organization (WTO), the U.S. insisted that the Russian Federation sign a special agreement on biotechnology which calls for Russia to no longer label foods containing GMOs and establishes patent and usage rights for U.S. corporations that cultivate GM seeds and crops within Russia. These measures will go into effect upon Russia's accession to the WTO, which, at this writing, is expected to take place in 2011 or early 2012.

Independent scientific testing of the effects of GMOs on rats, hamsters, and mice have generated great concern as to the safety of GMOs. The tests have been conducted by: Dr.

Irina Ermakova, the Institute of High Neural Activity and Neurophysiology of Russian Academy of Sciences, Moscow; Dr. Alexey Surov and Dr. Alexander Baranov, the Institute of Environmental and Evolution Problems and the Institute of Developmental Biology, Moscow); and Dr. Maria Konovalova, the Saratov Agrarian University.
All three of these studies demonstrate significant biological and behavioral changes in the animals when GM soya or GM corn was put into their feed. Some of the biological effects include increased mortality among newborns in the first generation, reduced quantity of offspring, spike in sterility among second generation animals. On the behavioral front, animals became more aggressive and lost maternal instincts.

Switzerland
Despite being the home country of Syngenta, Nestle, and Novartis and despite government representatives' push for GMOs, Swiss civil society prevailed in passing a moratorium on GM crops. The moratorium, passed in 2005 and extended again until 2013, is part of the Swiss Constitution.

GM food is not allowed on the market. Some GM corn and soy are imported into the country; however, GM animal feed imports have steadily declined over the last several years and today the agriculture department of Switzerland reports that 99.9 percent of animal feed is GM-free.

Ukraine
To date, no GM crops are grown in Ukraine, although GMOs have entered the food chain supply largely through contaminated imports. Food products with a GMO content of more than 0.1 percent are subject to mandatory labeling. Applications have been submitted to Ukraine for Monsanto's Bt potato (three varieties) and Roundup Ready Maize, Syngenta's Bt maize, glyphosate-tolerant sugar beet of Snygenta and Monsanto, and Bayer's GM rapeseed. All are undergoing field trials but have not yet received final approval for commercialization.
Ukraine has ratified the UN Cartagena Biosafety Protocol; however, the country does not have a well-developed biotechnology regulatory system.

UK
A GM Freeze campaign, is underway in the UK. The campaign, an alliance of environmental groups, development charities, religious organizations, businesses, and more, is united in calling for a freeze on growing GM plants; producing GM farm animals; importing GM foods, plants, and livestock feed; and on patenting of genetic resources for food and farm crops. The campaign, supported by 125 organizations, has extended goals that include calling for independent research and assessments on human health, the environment, and socio-economic implications of GMOs.

Voices from Africa
African farmers have relied on seed diversity developed over generations. For centuries, a variety of crops have been cultivated for nutritional aspects, taste, medicines, and culture.

Africa's food security is reliant on the farmer's right to save seed and continue to develop traditional knowledge and science.

Because GM seeds and crops threaten seed diversity as well as farmers' rights to save seed, Africa is largely free of GM commercial crops. However, in recent years a strong push from the biotechnology industry has resulted in an increase in GM field trials and commercialization.
South Africa was the first country in the region to approve GMOs. Beginning in 1997, South Africa has mainly grown GM maize, cotton, and soybeans. Potatoes, cassava, sugar cane, and grapes are examples of other GM crops that have been field-tested.

Several African countries are now moving toward GM crops. Nigeria has performed field trials on cassava and cowpea; Egypt on maize, cotton, wheat, potato, cucumber, melon, and tomatoes; Kenya on maize, cotton, cassava, sweet potato; and Uganda on banana, maize, cotton and sweet potato.

The Kenya Agricultural Research Institute (KARI) has been strongly influenced to direct its research toward GMOs as a result of funding it receives from Monsanto, Syngenta, and U.S. Agency for International Development (USAID). In Tanzania, the president recently announced a new initiative, "A New Vision for Agriculture," in collaboration with Monsanto, Syngenta, and USAID. In Burkino Faso, Monsanto and Syngenta Foundation funded the Institute for Environment and Agricultural Research to carry out trials of Bt cotton.

There are several industry-connected organizations working in many countries in Africa to promote GM seeds and crops and facilitate entry into Africa. The groups organize training, study trips, conferences, and also actively

lobby for biotechnology in Africa. Groups include: Agricabio, the African Agricultural Technology Foundation, African Biotechnology Stakeholders' Forum, Africa Harvest Foundation International, the Association for Strengthening Agricultural Research in Eastern and Central Africa, and the Open Forum on agricultural Biotechnology in Africa.

Many civil society groups in Africa are concerned about the massive influence of the Alliance for a New Green Revolution in Africa (AGRA), headquartered in Nairobi, Kenya. A consortium of industry, institutes, banks, and foundations such as the Bill and Melinda Gates Foundation, AGRA aims to bring a "Green Revolution" to Africa, based on an industrial agriculture system dependent on commercial seeds and chemical inputs. Several former Monsanto officials work for the Gates Foundation, which has invested more than $34 million in shares of Monsanto stock. Many speculate that AGRA will serve as a key venue for the technology's entry into Africa.

Counter to the touted claims that Bt cotton is helping small-scale farmers in South Africa's Makhatini Flats, after five years, the majority of farmers growing Bt cotton are now in debt and the number of farmers still growing the GM cotton has reduced by 80 percent. This story is typical of what happens throughout Africa. During the first year of GM plantings, companies and governments provide price supports for purchasing seeds and chemicals. They also provide infrastructure supports such as irrigation, extension services, farmer credit, and access to markets. At times, due to these supports, farmers experience a jump in income. However, after the first year of conversion, support is then withdrawn and lower crop yields and incomes result.

Contamination is a central issue in Africa as Africans migrate and seeds spread easily from one country to another. GM food and seeds are often dumped on unsuspecting Africans, often under the guise of being food aid.

In 2006, GM rice (LibertyLink Rice), unsuitable for human consumption, was found in West Africa. In Burkina Faso, approximately 3,000 organic farmers found their cotton contaminated with GM genes. This has affected their organic certification and their ability to sell to premium markets.

In South Africa, Biowatch engaged in a legal challenge with Monsanto over the right to access of information about biosafety and location of several GM crop field trials. After a protracted legal battle, the courts ruled that Monsanto was required to give the public access to most of the requested information public. However, prolonged legal procedures and expenses severely impacted the financial stability of Biowatch.

A weak biosafety law, promoted by a pro-GMO agricultural secretary, was passed in 2009 in Kenya. This further opens Kenya's door to GM seeds and crops. In August 2011, the government finally gazetted rules to allow GMO foods into Kenya. This has opened a new battlefront, with activists and a group of opposing scientists plotting court actions to block the regulations.

Ethiopia's biosafety laws follow a precautionary approach to GMOs; however, some civil society groups and researchers are finding that GM seeds and crops are being brought into the country illegally (via an underground market).

GMOs are allowed in South Africa; however, the Biodiversity Bill requires that GMOs be monitored, and the recently approved Consumer Act requires compulsory labeling of GMOs.

In Benin, civil society led a campaign that led to the renewal of a moratorium on GM. Mali also has maintained strict laws on GMOs.

Voices from Asia Pacific

Australia

Australia was an early adopter of GMOs. GM cotton was grown in the country beginning in 1996. The Florigene blue carnation, RR canola, and Bayer's LibertyLink canola followed shortly thereafter. Licensing for these products was granted even though there was no governmental research or assessment on potential health, safety, or environmental risks.

In the early 2000s, some state governments imposed temporary moratoria on the sale of GM seed. Most of the bans have now been lifted due to intensive campaigns undertaken by the biotechnology industry that included lobbying, marketing, and infiltrating research and scientific institutions. The intensity of the GM advocates is illustrated by a touring workshop geared for corporate executives entitled, "How to Beat Activists at Their Own Game." At one of the workshops, a speaker advised participants to "Take the moral high ground. …Tell politicians that when they support biotechnology they are demonstrating much needed moral and political leadership. Conversely, you may want to point out the immorality of those who oppose biotechnology."

The "revolving door" syndrome in which industry staff are hired for government posts is standard practice in Australia and has, predictably, resulted in legislation and policies that promote GM technologies. The symbiotic relationship between the Australian government and the biotech industry is further evidenced by the fact that, by 2010, Monsanto owned major shares in public-owned agricultural enterprises. State government departments also develop GM crops under contracts with biotech corporations.

Scientists in Australia are discouraged from airing concerns about GMOs in a few different ways. First, biotech companies simply refuse to allow analysis of their patented products. Second, several scientists have been dismissed from their posts after conducting research that questions the safety of GMOs.

There is limited labeling of foods containing GMOs. All GM vegetable oils, starches, and sugars, as well as eggs, meat and milk from animals fed with GM grains are exempt from any labeling. State governments are responsible for labeling standards; this greatly dilutes monitoring, testing, or enforcement of GM labeling.

India

In 1998, Monsanto with its Indian partner Mahyco, started illegal GM field trials in India, without approval of Genetic Engineering Approval Committee (GEAC), the statutory body for approving the release of GMOs into the environment.

Monsanto now controls 95 percent of the cotton seed market. It controls 60 Indian seed companies through licensing arrangements. It has pushed the price of seed from Rs. 7/kg to Rs. 3600/kg. Nearly half of this pricing reflects royalty payments.

The technology of engineering Bt genes into cotton was aimed primarily at controlling pests. However, new pests have emerged in Btcotton, leading to higher use of pesticides. In Vidharbha region of Maharashtra, which has the highest rate of farmer suicides, the area under Btcotton has increased from 0.2 million hectares in 2004 to 2.88 million hectares in 2007. Costs of pesticides for farmers has increased from Rs. 921 million to Rs. 13,264 billion in the same period, which is a 13-fold increase. Seed cost for cotton jumped from Rs. 7 to Rs. 3500 per kg. when Bt cotton was introduced.

In spite of Indian studies showing losses to farmers and in spite of the first Bt varieties not getting approval because of bad performance, and in spite of the fact that the state government of Andhra Pradesh is suing Monsanto for Bt cotton failure, Monsanto uses scientists to put out pseudo studies that claim that Indian farmers have benefitted from Bt cotton. Such studies are reliant on data supplied by the biotech industry; often the data is manipulated.

An example of Monsanto's manipulations of data is evident from the fact that Mahyco published data for 40 Bt cotton trial sites in areas where state governments had uprooted most of the Bt cotton in the trial sites.

Most of the 250,000 farmers suicides in India are in the cotton belt of Maharashtra, Punjab, Andhra Pradesh and Karnataka, and most cotton is now Monsanto's Bt cotton.

The International Food Policy Research Institute (IFPRI) released a report claiming that farmer suicides were not related to Bt cotton. However, the report is manipulative of the truth about farmer suicides and Btcotton at every level.

As one example, the report claims that farmer suicides has been a "long term" phenomena and cites statistics from the period of 1997 to 2007. However, ten years is not long term in a 10,000 year old farming tradition. And 1997 is precisely when the suicides take on an epidemic proportion due to seed monopolies, initially through hybrids and from 2002 through Bt crops. Also, the chronology of Btcotton introduction is false. The story begins with Monsanto's illegal Bt trials, not with commercialization in 2002.

Secondly, the report states that "In specific regions and years, where Btcotton may have indirectly contributed to farmer indebtedness (via crop failure) leading to suicides, its failure was mainly the result of the context or environment in which it was introduced or planted; Btcotton as a technology is not to blame". This is an interesting argument. A technology is always developed in the context of local socio-economic and ecological conditions. A technology that is a misfit in a context is a failed technology for that context. You cannot blame the context to save a failed technology.

In 2010, Monsanto admitted that the bollworm had become resistant to its Bt cotton in India. It then introduced Bollgard II with two Bt genes. It will be followed by Bollgard III, with three Bt genes. The toxic treadmill serves Monsanto well, but locks farmers into dependency of ever

increasing seed and pesticide costs, which will push them deeper into debt and suicide. Monsanto was caught undertaking illegal GM corn trials in the states of Bihar and Karnataka. According to India's Biosafety Laws, states must approve trials; however, Monsanto had not sought any such approval. The Chief Minister of Bihar wrote to the Environment Minster to stop the trials.

In February 2010, the Minister of Environment of India, Jairam Ramesh, after conducting public hearings across the country, ordered a moratorium on the commercial release of Bt Brinjal (eggplant). The hearing process exposed the unscientific basis on which genetically engineered crops are being commercialized and the regulatory chaos and corruption in biosafety.

Monsanto is on the board of the US-India Knowledge Initiative in Agriculture, a bilateral free trade agriculture agreement. This is one example of how it gains access and exercises undue influence on the U.S government and the government of India.

Japan

There is currently no commercial cultivation of GM crops in Japan; however, because Japan imports approximately 60 percent of its food and much of it is GMO, people are consuming GMO foods.

Monsanto works with the U.S. government to minimize any labeling standards in Japan. As a result, labeling requirements are not comprehensive. For example—there are no mandatory rules to label oil products, most of which contain GM soy, corn, or canola. Japan also does not require labeling for animal feed. And, Japan now allows food with GMO residues of up to 5 percent to be labeled as "non GMO."

GMOs are also entering Japan via food and seed imports. GM canola seeds, spilled in transport, are a particular problem and have crossed with existing agricultural crops, weeds, and edible plants. Wild-growing canola has been contaminated by the GM canola and trans-gene hybridization has occurred with food crops such as broccoli and weeds such as tumble mustard.

When contamination is found, Monsanto claims its patent rights, but does not take responsibility for the threat to biodiversity caused by the spilled GM canola.

⋆ *Debbie Barker, International Program Director, Center for Food Safety, Washington D.C. Formerly served as the co-director of the International Forum on Globalization (IFG), a think tank that analyses and critiques forms of economic globalization from 1996 to 2008. She recently authored 'The Wheel of Life: Food, Climate, Human Rights and the Economy' issued by the CFS and the Heinrich the Heinrich Böll Stiftung Foundation and 'The Predictable Rise and Fall of Global Industrial Agricultur'e, which highlights international policies causing ecological and social harm, and provides alternative strategies to the current food system.*

III. Twelve Paragraphs on Biotechnology*

Wendell Berry

I.
I understand, from my scientific mentors and my reading, that there are two areas in which the relationship of causes and effects is highly complex: that which is internal to organisms, and that of the larger natural and human contexts – ultimately the world. In biotechnology, as in any technology affecting living systems, there is nothing perfectly predictable. What we do within living bodies and in the living world is never a simple mechanical procedure such as threading a needle or winding a watch. Mystery exists; unforeseen and unforeseeable consequences are common.

II.
As applied in the living world, biotechnology, like any technology, will be used with specific and necessarily limited intentions for specific and limited purposes. Like any technology so applied, it risks unpredicted effects; and it will have, even less predictably, what we might properly call influences, not only on the biological and ecological systems in which it is applied, but also on human economies, communities, and cultures.

III.
It is therefore not surprising that the criticism of the work so far of the biotechnologists has begun with the accusation that their publicity and advertising their science has been seriously oversimplified, and thus made available for the same sort of aggressive mass marketing that sells breakfast cereal.

IV.
Biotechnology, as practiced so far, is bad science – a science willingly disdainful or ignorant of the ecological and human costs of previous scientific-technological revolutions (such as the introduction of chemistry into agriculture), and disdainful of criticism within the scientific disciplines. It is, moreover a science involved directly with product-development, marketing, and political lobbying on behalf of the products – and, therefore, is directly corruptible by personal self-interest and greed. For such a science to present itself in the guise of objectivity or philanthropy is, at best, hypocritical.

V.
Further problems arise when we consider biotechnology as an "agribusiness". As such, its effect will be to complete the long-established program of industry in agriculture, which has been to eliminate the ecological and cultural "givens": natural fertility, solar energy, local genetics, agronomic weed and pest control, animal husbandry – and now the entire genetic commonwealth. The aim, in short, is to require every farmer to come to a corporate supplier for every need.

VI.
As a science specifically agricultural, biotechnology would enlarge, and worsen, another problem related to the industrialization of farming; that is, the failure to adapt the farming to the land. In agricultural biotechnology, as in industrial agriculture generally, the inevitable emphasis is upon uniformity – in crop varieties, livestock breeds, methodologies, animal carcasses and so on.

VII.
But as local adaptation is the inescapable requirement for the survival of species, so is the indispensable criterion for an enduring agriculture. Ultimately, the problem of agriculture – as such, not as an industry – will be solved on farms, farm by farm, not in laboratories or factories. And so we must regard every proposed industrial solution to an agricultural problem – including biotechnology – as potentially a distraction from the real problem and an obstacle to the real solution.

VIII.
Finally, to do full justice to this issue, we must consider the likelihood that genetic engineering is not just a science, a technology, and a business but is also an intellectual fad and to some extent an economic bubble. It is being sold, and therefore oversold, as the latest answer-to-everything: it will solve the problem of hunger; it will cure every disease; it will "engineer our emotions, to make us happy and content all the time" (even, presumably, when we are broke, friendless, and have been hit by a car): it will permit everybody's genome to be "read" in a sort of new-age palmistry. It is swarmed about by speculators and by what Sharon Kardia of the University of Michigan called "snake oil salesmen".

IX.
Biotechnology also is extremely expensive in comparison to conventional plant breeding and is costly to farmers. Some biotechnology companies are begging for money, while others are giving huge grants to university microbiology departments. The industry's attitude toward farmers is hostile, as demonstrated by its lawsuits against them and its pursuit of the "terminator gene". Its attitude toward consumers is aggressive and contemptuous, as demonstrated by its campaign against labelling.

X.
The biotechnology industry is thus founded on questionable science, is ethically obscure, is economically uncertain; it involves unconfronted dangers to the natural world and human health, and its economic benefit to farmers or to food production has not been demonstrated. It is the sort of gamble typically attractive to corporate investors and venture capitalists, who in fact have supported it lavishly. Any biotechnology enterprise that fails to attract sufficient funds from those sources should be considered to have failed a critical test. Such an enterprise cannot responsibly be bailed out with public funds or with funds dedicated to the relief of distressed farmers. To do so would be, in effect, to levy a tax for the support of a private business. It would be a breach of trust.

XI.
Richard Strohman, of the University of California-Berkeley, has proposed that the problems of biotechnology arise, not because the science is new, but because it is old. He sees it is a development of a new outdated paradigm according to which scientists have undertaken to supply simple solutions to complex problems, without due regard to the complexity of the problems. The proper scientific response to this, he says, is to enlarge the context of the work.

XII.
If biotechnology is not a sufficient, or even an adequate, answer to agricultural problems, then what do we need? My own answer is that we need a science of agriculture that is authentically new – a science that freely and generously accepts the farm, the local ecosystem, and the local community as contexts, and then devotes itself to the relationship between farming and its ecological and cultural supports.

⋆ *From Citizenship Papers, 2002*

Wendell Berry is a conservationist, farmer, essayist, novelist, professor of English, and poet. The New York Times has called Berry the "prophet of rural America." Wendell Berry is the author of more than 30 books of essays, poetry and novels. He has worked a farm in Henry County, Kentucky since 1965.

IV. Voices from Grass Roots

The following are quotes from articles of contributing authors of the Global Citizens Report on the State of GMOs in Section III on Voices from Grass Roots and Section IV Warnings from Scientists. The full report is available on the web www.navdanyainternational.it.

A. THE AMERICAS

Canada: "The first trial judge…ruled that it doesn't matter how Monsanto's GMOs get into any farmers' fields. If it gets in there, you no longer own your seeds or plants. They become Monsanto's property." *Percy Schmeiser, Farmer*

USA: "GM crops increased pesticide usage in the U.S. by 318.4 million pounds from 1996-2008. Approximately 70 percent of processed foods on supermarket shelves in the U.S contain GM ingredients… Yet there is no labeling of foods" *Debbie Barker, Centre for Food Safety (CFS), www.centerforfoodsafety.org.*

Mexico: "Corn is the basic food of Mexico. In 2001 scientists found native corn varietiescontaminated with transgenes… Corn imported from the US was the source of the contamination." *Ana de Ita, Center of Studies for Rural Change in Mexico (CECCAM) www.ceccam.org.mx.*

Latin America: "GMOs, predominantly in soy, currently occupy most of the region's agricultural production, making the *United Republic of Soy* a reality, part of a production model with terrible consequences for a large majority of social sectors" *Carla Poth, Network for a GE Free Latin America (RALLT) www.rallt.org.*

Uruguay: "350 million liters of glyphosate have been sprayed on GM soy in the most recent planting season." Pablo Gimenez, Friends of the Earth, Uruguay, (REDES-AT) www.redes.org.uy.

Patagonia: "Today (Latin America's) natural and agricultural biodiversity is being destroyed and surrendered to a handful of multinationals. 5000 years of agricultural history are being dissolved, further driving its inhabitants to humiliation and dependency." *Marcelo Viñas, Conservation Land Trust, www.theconservationlandtrust.org.*

B. EUROPE

Western Europe:

France: "The systemic herbicide Roundup, developed by Monsanto, destroys all the plants with which it comes into contact. In other words, it is complete poison." Jose Bove, farmer

Germany: "(There is) broad consensus in society that patents on life are actually an assault against fundamental values it holds." *Benny Haerlin, Save our Seeds (SOS), www.saveourseeds.org*

Italy: "Tuscany was the first region to adopt a law which prohibited the cultivation of transgenic crops and launched a political platform to allow European regions to choose to keep their territories GMO free" *Maria Grazia Mammuccini, Navdanya International, www.navdanyainternational.it*

In Italy the issue of GMOs has given rise to a phenomenon of active resistance to protect a culture of knowledge rooted in farmers' knowledge and in the essences of the countryside. Luca Colombo, Italian Foundation for Research in Organic Farming (FIRAB) *www.firab.it.*

Switzerland: "So even in the home-country of Syngenta, Nestlé, Novartis & Co. people say No to GM food." *Florianne Koechlin, Blueridge Institute, www.blauen-institut.ch.*

European Science Network: Italy "ENSSER laboratories often face the opposition of leading GMO producers (Monsanto, Dupont, and Syngenta) and their negative influence on the European Commission and some national governments." *Marcello Buiatti, Genetic Scientist, www.ensser.org.*

Eastern Europe:
Poland: "…the proposed liberalised 'Seeds Act' was prevented from becoming law only when Polish President Komorowski - under significant public pressure - vetoed it at the last moment, declaring that he had 'nothing against GMO' but found the proposed Act "rubbish". *Julian Rose and Jadwiga Lopata, International Coalition to Protect the Polish Countryside (ICPPC), www.icppc.pl/eng.*
Russia: "GMOs in Russia will lead to economic slavery, seizure by transnationals of national genetic resources market, the annihilation of biodiversity, of national breeds and types of plants." *Alexander Baranoff, scientist*
Ukraine: "No GMO has been approved/ registered in Ukraine so far … However, GMOs have entered the food chain supply mainly through contaminated import consignments." *Alex Sytnik, All-Ukrainian Environmental League*

C. AFRICA:
"Many are deeply suspicious of AGRA's ultimate aims…it is opening up huge new markets for the agribusiness industry by persuading millions of African farmers to become dependent on their seeds and chemicals." *African Biodiversity Network, www.africanbiodiversity.org.*

D. ASIA PACIFIC:
India: "Beginning with Bt. Cotton in 1998, Monsanto has been violating laws, corrupting governments, engaging in biopiracy, creating seed monopolies, destroying biodiversity and pushing small farmers into debt and suicide" *Vandana Shiva, Navdanya, www.navdanya.org.*
Japan: "The first thing Monsanto did in Japan was intervene and oppose the GM food labelling regulation… and pressured the U.S. government to urge the Japanese government to minimize the obligatory labelling category…." *Amagasa Keisuke, GMO NO! Campaign, www.worc.org/Japan-no-gm.*
Australia: "Independent researchers have found it almost impossible to get GM seed to carry out safety checks… any farmer who buys seed is forbidden to use it for research purposes. Scientists who question the technology are marginalised." *GeneEthics Network/Madge, www.geneethics.org.*

V. Voices from Science

A. WARNINGS FROM SCIENTISTS

Miguel Altieri: "Biotechnology will exacerbate marginalization of small and resource-poor farmers even more as such technologies are under corporate control and protected by patents". *President, Sociedad Cientifica Latino Americana de Agroecologia (SOCLA), Professor of Agroecology at UC Berkeley.*

Irina Ermakova: '(the experiment) revealed the high mortality (~ 55,6%) of rat pups in first generation after addition of GM-soy (Roundup Ready, RR) into the diet of rat females (before pregnancy, during pregnancy and during lactation). *Leading scientist at the Institute of Higher Nervous Activity and Neurophysiology of Russian Academy of Sciences.*

Bill Freese: "Epidemiological studies of farmers have shown an association between contact with glyphosate herbicides and higher rates of certain cancers – non-Hodgkin's lymphoma, hairy cell leukemiai and multiple myeloma" *Science Policy Analyst, Center for Food Safety, Washington D.C.*

Hans Herren: "Wherever GMOs are being deployed, the varieties offered to the farmers have been reduced, in some places to the level of only GMOs being available". President of the *Millennium Institute; Founder and president of the Bio Vision foundation, internationally recognized scientist and development expert. www.millennium.institute.org*

Mae Wan Ho: "scientists… announced the discovery of 'a previously unknown route' whereby 'GM genes may escape into the natural environment'… The "escape" referred to is horizontal gene transfer – the spread of GM genes by infection and multiplication." *Geneticist, Biophysicist and Director of Institute of Science in Society http://www.i-sis.org.uk/.*

Tiruvadi Jagadisan: "Let us not murder Indian agriculture by fostering genetically modified seeds without fully being aware of what it could lead us into both in terms of human and animal health and our natural biodiversity."
T.V. Jagadisan, scientsts, former Managing Director, Monsanto India.

David Suzuki: "Nowhere is (the Precautionary Principle) more important than in biotechnology because it enables us to tamper with the very blueprint of life." *Award-winning geneticist and broadcaster, Co-Founder of the David Suzuki Foundation, Professor Emeritus, University of British Columbia.*

VI. The History of Monsanto

A. Timeline: 1901-2009*

Over its 108-year history, Monsanto Co (MON.N), the world's largest seed company, has evolved from primarily an industrial chemical concern into a pure agricultural products company. Following is a timeline of the St. Louis, Missouri-based company's history published by Reuters, 11 November 2009.

- 1901 - Original Monsanto founded as a maker of saccharine by John F. Queeny and named after his wife, Olga Monsanto Queeny.
- 1920s and 1930s - Manufacturers sulfuric acid and other chemicals, including polychlorinated biphenyls (PCBs), which are later implicated in reproductive, developmental and immune system disorders.
- 1940s - Manufactures plastics and synthetic fabrics
- 1960s - Establishes agricultural division with focus on herbicides.
- 1962-1971 - Becomes one of principal companies supplying herbicide known as Agent Orange to U.S. military for use in Vietnam War. Agent Orange is later linked to various health problems, including cancer.
- 1976 - Commercializes Roundup herbicide, which goes on to be a top seller around the world.
- 1982 - Some 2,000 people are relocated from Times Beach, Missouri, after area is contaminated with PCB by-product dioxin. Critics say a St. Louis-area Monsanto chemical plant was a source but company denies any connection.
- 1994 - Wins regulatory approval for its first biotech product, a dairy cow hormone called Posilac.
- 1996 - Introduces first biotech crop, Roundup Ready soybeans, which tolerate spraying of Roundup herbicide, and biotech cotton engineered to resist insect damage.
- 1997 - Spins off its industrial chemical and fibers business into Solutia Inc amid complaints and legal claims about pollution from its plants. Introduces new biotech canola, cotton and corn, and buys foundation seed companies.
- 1998 - Introduces Roundup Ready corn.
- 2000-2002 - Restructures in deal with Pharmacia & Upjohn Inc; separates agricultural and chemicals businesses and becomes stand-alone agricultural company.
- 2002-2003 - Jury finds Monsanto plant in Anniston, Alabama, polluted community with PCBs. Monsanto and Solutia agree to pay $600 million to settle claims brought by 20,000 Anniston residents of PCB ground and water contamination.
- 2003 - Solutia files Chapter 11 bankruptcy.
- 2004 - Monsanto forms American Seeds Inc holding company for corn and soybean seed deals and begins brand acquisitions.
- 2005 - Environmental, consumer groups question safety of Roundup Ready crops, say they create "super weeds," among other problems.
- 2006-2007 - Buys several regional seed companies and cotton seed leader Delta and Pine Land Co. Competitors allege Monsanto gaining seed industry monopoly.
- 2008 - Acquires sugarcane breeding companies, and a Dutch hybrid seed company. Sells Posilac business amid consumer and food industry concerns about the dairy cow hormone supplement.
- 2008-2009 - U.S. Department of Justice says it is looking into monopolistic power in the U.S. seed industry.
- 2009 - Posts record net sales of $11.7 billion and net income of $2.1 billion for fiscal 2009. Announces project to improve the living conditions of 10,000 small cotton and corn farmers in 1,100 villages in India; donates cotton technology to academic researchers.

*http://www.reuters.com/article/2009/11/11/food-monsanto-idUSN1032100920091111

B. Record of Monsanto

Dr. P.M. Bhargava★

● 1969: Produces Agent Orange, which was used as a defoliant by the U.S. Government during the Vietnam War. I have myself seen defoliated trees over a hundred miles south of Hanoi in 1982.
● 1976: Monsanto produces Cycle-Safe, the world's first plastic soft-drink bottle. The bottle, suspected of posing a cancer risk, is banned the following year by the Food and Drug Administration of the U.S.
● 1986: Monsanto found guilty of negligently exposing a worker to benzene at its Chocolate Bayou Plant in Texas. It is forced to pay $100 million to the family of Wilbur Jack Skeen, a worker who died of leukaemia after repeated exposures.
● 1986: Monsanto spends $50,000 against California's anti-toxics initiative, Proposition 65. The initiative prohibits the discharge of chemicals known to cause cancer or birth defects into drinking water supplies.
● 1987: Monsanto is one of the companies named in an $180 million settlement for Vietnam War veterans exposed to Agent Orange.
● 1988: A federal jury finds Monsanto Co.'s subsidiary, G.D. Searle & Co., negligent in testing and marketing of its Copper 7 intrauterine birth control device (IUD). The verdict followed the unsealing of internal documents regarding safety concerns about the IUD, which was used by nearly 10 million women between 1974 and 1986.
● 1990: EPA chemists allege fraud in Monsanto's 1979 dioxin study which found their exposure to the chemical doesn't increase cancer risks.
● 1990: Monsanto spends more than $405,000 to defeat California's pesticide regulation Proposition 128, known as the "Big Green" initiative. The initiative was aimed at phasing out the use of pesticides, including Monsanto's product Alachlor, linked to cancer and to global warming.
● 1991: Monsanto is fined $1.2 million for trying to conceal discharge of contaminated waste water into the Mystic River in Connecticut.
● 1995: Monsanto is sued after allegedly supplying radioactive material for a controversial study which involved feeding radioactive iron to 829 pregnant women.
● 1995: Monsanto ordered to pay $41.1 million to a waste management company in Texas due to concerns over hazardous waste dumping.
● 1995: The Safe Shoppers Bible says that Monsanto's Ortho Weed-B-Gon Lawn Weed Killer contains a known carcinogen, 2,4 D.
● 2005: According to the U.S. Securities & Exchange Commission, Monsanto bribed at least 140 Indonesian officials or their families to get Bt cotton approved without an environmental impact assessment (EIA). In 2005, Monsanto paid $1.5 million in fines to the US Justice Department for these bribes.
● 2005: Six Government scientists including Dr. Margaret Haydon told the Canadian Senate Committee of Monsanto's 'offer' of a bribe of between $1-2 million to the scientists from Health Canada if they approved the company's GM bovine growth hormone (rbGH) (banned in many countries outside the US), without further study, and how notes and files critical of scientific data provided by Monsanto were stolen from a locked filing cabinet in her office. One FDA scientist arbitrarily increased the allowable levels of antibiotics in milk 100-fold in order to facilitate the approval of rbGH. She had just arrived at the FDA from Monsanto.
● 2005: The US Patent and Trademark Office rejected four key Monsanto patents related to GM crops that the Public Patent Foundation (PUBPAT) challenged because the agricultural giant is using them to harass, intimidate, sue - and in some cases bankrupt - American farmers. Monsanto devotes more than $10 million per year to such anti-farmer activities, over alleged improper use of its patented seeds.
● 2005: The Alabama Court Judgement in

February 2002 best describes the sort of business that Monsanto is in. In 1966, court documents in a case concerning Anniston residents in the US showed that Monsanto managers discovered that fish dunked in a local creek turned belly-up within 10 seconds, spurting blood and shedding skin as dropped into boiling water. In 1969, they found fish in another creek with 7,500 times the legal PCB level. But they never told their neighbours and concluded that "there is little object in going to expensive extremes in limiting discharges – we can't afford to lose one dollar of business". In fact court documents revealed that the company withheld evidence about the safety of their PCBs to the residents of the town that were being poisoned by their factory to keep their profitable dollars. On February 22, 2002, a court found Monsanto guilty on six counts of Negligence, Wantoness And Supression of the Truth, Nuisance, Trespass And Outrage. Outrage according to Alabama law is 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."

- 2005: Monsanto omitted incriminating data altogether from its 1996 published study on GM soybeans. When the data was recovered later by an investigator, it showed that GM soy contained significantly lower levels of protein and other nutrients and toasted GM soy meal contained nearly twice the amount of a lectin (protein) that may block the body's ability to assimilate other nutrients. Furthermore, the toasted GM soy contained as much as seven times the amount ot trypsin inhibitor, a major soy allergen. Monsanto named their study: "The composition of glyphosate-tolerant soybean seeds is equivalent to that of conventional soybeans"
- In Europe, Monsanto refused to reveal the results of its own secret animal feeding studies, which revealed serious abnormalities to rats fed GM corn, citing CBI (Confidential Business Information) until forced to do so by a German Court. One of its Bt corn products (the only GM crop grown in the EU) was subsequently banned for planting in France and other EU countries based on the appraisal by Seralini of Monsanto's own dossier.
- 2009: A U.S. Federal Court ruled on 24th September, 2009, that USDA violated federal law by allowing Monsanto's genetically engineered sugar beet on the market.
- 2009: As is usually known (and supported by a letter from Meera Shankar, our Ambassador to the U.S., to PMO), it is common for U.S. MNC's to bribe Indian officials to achieve their objectives.

⋆ *Dr. P. M. Bhargava, architect of molecular biology and biotechnology in India. Is currently the chairman of MARCH (The Medically Aware and Responsible Citizens of Hyderabad). A recipient of the Padma Bhushan and France's highest civilian honour, Legion d'Honneur, the National Citizens' Award, founder director of one of the world's best laboratories in modern biotechnology, the Centre of Cellular and Molecular Biology, Hyderabad, currently a centre of excellence recognized by UNESCO.*

VII. Actions for Food Democracy

GMOs have become the testing site for our freedoms and democracy.
They are defining the entire system of control of our food, based on an illusion.

Over the last two decades movements have grown around the world with creative actions and creative ideas that have helped people resist GMOs.

This report is a distillation of the movement for building the food democracy that has become vital for our survival.

Below are actions that will contribute towards achieving this goal.
Join the chorus in exposing the GMO Emperor and help build Food Democracy for all.

● **Campaign to Disinvest from Monsanto:** get your money out of Monsanto – at the personal level and at the institutional level. Don't invest in financial institutions that invest in Monsanto. Start a campaign of disinvestment from Monsanto and lobby governments, banks, foundations and organizations to divest from Monsanto.
The youth of Norway have already started the process to get Norway's Oil Fund out of Monsanto.
http://www.combat-monsanto.co.uk, www.monsanto.no

● **Boycott GMOs - Eat organic.** Stop buying GMO products. One of the illusions created by the GMO Emperor is that organic cannot feed the world. This is scientifically not the case as pointed out in the IAASTD report and UN Special Rapporteur report on the right to food. www.gene-watch.org.
http://www.organicconsumers.org/action.cfm

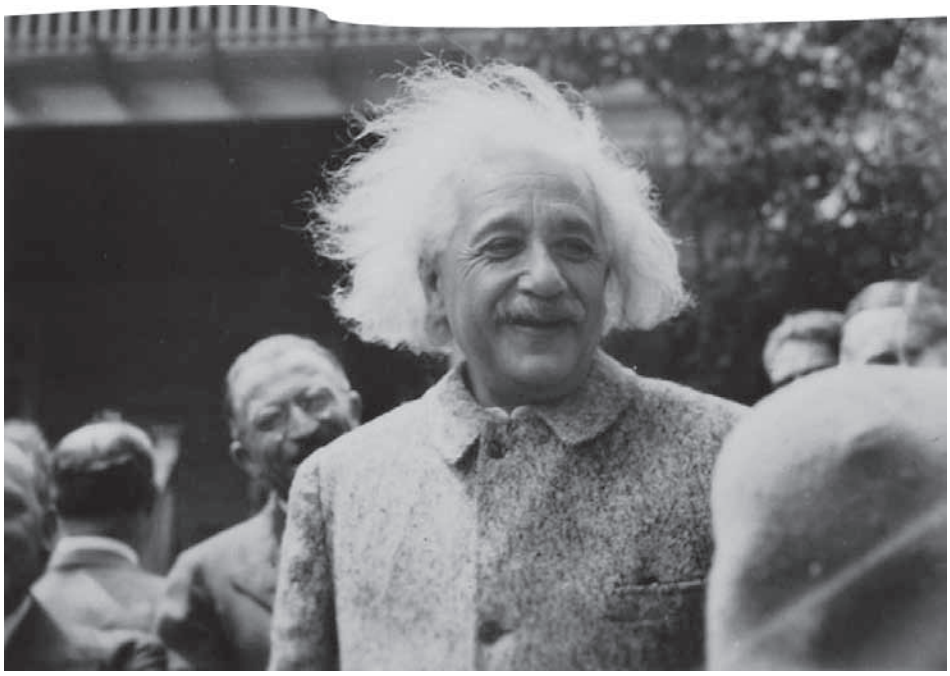
● **Demand Labeling of GMOs.** Uphold your right to know what you eat. In a food democracy you have the right to know what you eat. On July 5, 2011, Codex Alimentarius, the international food safety body recognized the right of countries to label GMO foods. Thus (after 20 years of battle) the consumer right to be informed has been secured. www.consumersinternational.org

● **Put your money to support local ecological/organic food projects and invest in the future**. Become partners with farmers who are producing organic food, join Community Supported Agriculture (CSAs), support a farmer's market, and support organic farming in your region to build local food systems through creative innovative local financing. Start Gardens of Hope in your community, your backyard and in your schools. *http://www.organicgardeninfo.com*

● **Campaign to get your village/town/region/country GMO-free**. Become part of the world wide GMO-free movement. Write to your municipality, your town council, your regional government and your national government that you want your region to be GMO-free. Join the True Food Network to sign on to letters to Congress, governmental agencies, and other campaigns as well as receive action alerts for events across the U.S. *http://truefoodnow.org*

● **Help save seeds.** Support groups that save seeds and are reclaiming seed as a commons. Create community seed banks, to save and exchange open pollinated varieties of seeds. Seed freedom is the first step in food freedom. Saving Our Seeds provides information, resources, and publications for gardeners, farmers, seed savers, and seed growers. *http://www.savingourseeds.org*

And finally:
● **Join the chorus** in exposing the GMO Emperor and help build real Food Democracy for all – sign on at: *www.navdanyainternational.it*



http://murfdipity.com/

"We can't solve problems by using the same kind of thinking we used when we created them"

Albert Einstein

Printed by Indstria Grafica Valdarnese
in Italy, October 2011