Control Through Contamination

US Forcing GMO Corn and Free Trade on Mexico and Central America

A report by S'ra DeSantis
for ISE Biotechnology Project and ACERCA

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Written by: S'ra DeSantis (ACERCA/Institute for Social Ecology Biotechnology Project)
Additional text by: Aziz Choudry (GATT Watchdog), Brad Hash (ASEJ), and Brian Tokar (ISE Biotechnology Project)
Principal editor: Brian Tokar
Other editing: Doyle Canning (ISE Biotechnology Project), Aziz Choudry, S'ra DeSantis, Brendan O'Neill (ACERCA/ASEJ), Anne Petermann (ACERCA/ASEJ), Tom Ricker (Quest for Peace/Quixote Center), Lauren Sullivan (ACERCA/ASEJ), Kevin Walsh (Food Not Lawns, Montreal)
Layout: Kevin Walsh (kev@tao.ca)
Drawings: The Beehive Collective (www.beehivecollective.org)
Photos: Daniel Goossen, Orin Langelle, and Danielle Rolli
Research and translation assistance in Mexico and Central America: Dan Goossen and Danielle Rolli
Printed by: Peter Hendy
Spanish translation by: Sarah Stowell and José Alemán

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This report will be available in English and Spanish on ASEJ's website at www.asej.org and the Institute for Social Ecology's Biotechnology Project's website www.nerage.org.

If you have any questions or comments you can contact S'ra DeSantis at sra@riseup.net

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The Biotechnology Project is an internationally recognized grassroots initiative for biotechnology activism, committed to expanding public debates around genetic engineering and other biotechnologies through popular education, the development of grassroots opposition, and community-based activist networks.

ACERCA (Action for the Community and Ecology in the Regions of Central America) is a project of Action for Social and Ecological Justice (ASEJ). ASEJ has advanced community initiatives for social and ecological justice in the Americas and around the worked through innovative programs since 1993.

Acronyms

ABF – American Business Forum
ADM – Archer Daniels Midland
Bt – *Bacillus thuringiensis*
CAFTA – Central American Free Trade Agreement
Conabio – Commission on Biodiversity (Mexico)
DNA – deoxyribonucleic acid
EPA – Environmental Protection Agency (United States)
FDA – Food and Drug Administration (United States)
FTAA – Free Trade Area of the Americas
GATS – General Agreement on Trade in Services (WTO)
GATT – General Agreement on Tariffs and Trade (WTO)
GE – genetically engineered
GMO – genetically modified organism
HTC – herbicide tolerant crop
IDB – Inter-American Development Bank
IMF – International Monetary Fund
INE – National Ecological Institute (Mexico)
IPC – insecticide producing crop
MAI – Multilateral Agreement on Investments
NAFTA – North American Free Trade Agreement
OAS – Organization for American States
OECD – Organization for Economic Cooperation and Development
RRI – Rowett Research Institute (Scotland)
SAGARPA – Secretariat for Agriculture, Livestock, Fisheries and Food (Mexico)
SAP – structural adjustment program
SPS – Sanitary and Phytosanitary Measures (WTO)
TNCs – transnational corporations
TRIPS – Trade-Related Aspects of Intellectual Property Rights (WTO)
USDA – United States Department of Agriculture
UNES – Salvadorian Ecological Unity
USAID – United States Agency for International Development
USTR – United States Trade Representative
WTO – World Trade Organization

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Introduction

Through free trade agreements and international food aid, United States-based agribusiness corporations are contaminating indigenous corn crops throughout southern Mexico with DNA from genetically modified organisms (GMOs). The apparent strategy of these corporations is to spread genetic contamination throughout the world through future free trade agreements, which force poorer countries to accept exports of genetically modified seeds and products. Transnational corporations (TNCs), especially Monsanto, want to promote the idea that the world's food supply is thoroughly contaminated, even though it is not, so there can be no effective regulation of GMOs. The North American Free Trade Agreement (NAFTA) has allowed the United States to dump millions of tons of corn onto Mexico. Thirty to forty percent of this corn is genetically modified[1] and has resulted in contaminating 8% of the indigenous corn in Oaxaca, Mexico with DNA from GMOs.[2] The contamination in Oaxaca serves as a prime example of how genetically engineered crops and free trade interface; together they create the genetic pollution of corn in its center of origin.

In the current political climate of the "War on Terror," President Bush is pushing an agenda of "free trade," claiming this will help fight global terror. Central America is currently under attack by the Bush Administration, which is aggressively negotiating two free trade agreements for the area, the Free Trade Area of the Americas (FTAA) and the Central American Free Trade Agreement (CAFTA). One of the main goals of these free trade agreements is to secure dumping grounds for US genetically engineered (GE) products, since numerous countries throughout the world continue to close their doors to GE imports.

This report will look at the basics of genetic engineering, the types of genetically engineered crops that are currently on the market and the risks they pose to the environment, farmers' economic livelihood, and human health. Genetic engineering will be placed in the context of free trade agreements and so-called development projects in Mexico and Central America. Finally this report will discuss the solutions that grassroots organizations in Mexico and Central America are already offering to stop the genetic contamination of their crops.

Part 1: Genetic Engineering

The domination of life has now reached the most intimate cellular level through the process of genetic engineering. In nature, bacteria and differing plant and animal species cannot share genetic material. Genetic engineering has eliminated these boundaries; now different forms of life, like animals, plants, fungi, and bacteria can exchange portions of their DNA. These processes do not happen naturally, but rather in laboratories usually controlled by transnational corporations, such as Monsanto, Bayer or Syngenta.

Scientists genetically engineer plants and animals to display commercially desired characteristics. A 1997 report about genetically engineered crops determined that at the time 93% of GE crops being developed were to alter farm practices while 7% were being engineered to enhance nutritional or flavor value.[3] For example, scientists have genetically engineered tomatoes to be slightly resistant to frost by isolating and inserting genes from a fish that can live in cold temperatures.

The first commercialized genetically engineered vegetable in the United States was the Flavr Savr tomato. Calgene engineered the tomato to ripen slower and have a shelf life of several weeks. The GE tomato bruised more easily during the mechanical harvesting and packing process and was withdrawn from the market by 1996. Other crops have been genetically engineered to produce insecticides or be resistant to herbicide spraying (*See pages 6-10*). The four main

genetically engineered crops available today are corn, soy, cotton, and canola. Monsanto is currently trying to release genetically engineered wheat, clover, rice and turf grass onto the market.

Animals have also been genetically engineered to enhance their profitability. Scientists genetically manipulated chickens so that they would be born without feathers, to make processing easier and less costly. Genes from chickens, humans, and rats were inserted into trout and salmon so the fish could either grow faster or larger.[4] Corporations have genetically altered trees, such as eucalyptus and poplar, to produce more pulp for paper processing (*See GE Trees, page 32*. This report will mostly focus on genetically engineered food crops, especially corn, since corn is the basis of *campesino* life in Mexico and Central America.

The "life sciences" industry promotes genetically engineered plants as a natural progression of thousands of years of plant breeding. Some people confuse hybrids and genetically engineered plants. Hybrids can occur in nature, but are most often developed either in laboratories or in outside field experiments. Hybridization relies on either sexual or asexual methods of reproduction. Hybrids can combine genetic traits from different varieties of the same type of plant through crossbreeding, while genetic engineering directly introduces new genetic material (segments of DNA) from one species into another species, quite often from different biological kingdoms. The majority of hybrids cross two inbred strains of plants that are in the same species (sometimes it can be done between different genera, called "wide crosses," but this is rare).[5]

The process of genetic engineering is incredibly imprecise. It requires a "gene gun," an appropriate name for such an invasive technology. Tiny pellets of gold or tungsten are coated with DNA from one or several organisms. The gene gun fires these pellets into another organism's embryo at velocities that can reach up to 1,400 feet per second. Some of the DNA from the pellets enters the nuclei of the host cells. This process inserts the foreign DNA randomly along the host cell's genome and the DNA bundle can splinter or double up. Often tens of thousands to millions of shots have to be fired to get a few "successfully" engineered plants.[6] Scientists who genetically alter organisms have barely studied what effects this random genetic disruption can have on the new organism.

Types of Genetically Modified Crops

Insecticide Producing Crops

Genetically engineering crops that produce an insecticide within their cells are known as "insect-protected crops" (IPCs) by the biotechnology industry. This is a misleading term since the plants will only be "protected" against certain insects that the insecticide either intentionally or unintentionally targets. Activists renamed IPCs "insecticide producing crops" because the genetically engineered toxins or insecticides are present in every cell of the plant. Industry implies that IPCs will benefit the environment because less chemical insecticides will be sprayed on plants when IPCs are cultivated. However, the amount of insecticides actually increases with IPCs because they are now found throughout the entire plant, instead of just being sprayed topically.[7] The engineered insecticide will be effective against a single variety of crop pests, but often higher doses of other insecticides are needed to control crop pests besides the ones targeted by the GE toxin.

The only IPC that is used commercially today is Bt. *Bacillus thuringiensis* is a naturally occurring soil bacterium, which produces a series of protective proteins toxic to various insects. Bacterial DNA that contains the genetic code for a particular Bt toxin is genetically engineered into crop plants. The only commercially available crops that currently have Bt toxins genetically engineered into them are corn, potatoes and cotton, while dozens of others are still waiting approval.[8]

There have been several negative effects associated with the use of genetically engineered Bt crops, including: insect resistance to the insecticide, cross-pollination with wild relatives or neighboring fields, harm to beneficial insects, and incidences of false pregnancies in pigs fed with Bt corn. Scientists throughout the world have assessed that target pests will become resistant to IPCs because not all insects will die from eating IPCs; some of these survivors will evolve to become resistant instead.[9] Organic farmers, who utilize forms of Bt bacteria as a natural insecticide, spray it sparingly on crops, such as potatoes, to kill the Colorado potato beetle. When the beetle ingests the Bt, toxins from the Bt will kill the beetle. Bt sprayed topically is in a non-active form, which only becomes activated when it is consumed by insects with highly alkaline digestive systems.[10] It breaks down in sunlight hours after it is applied.[11] The Bt toxins that are genetically engineered into plants are soluble, active and lethal as soon as the plant produces them. Bt crops produce up to 20 times as much toxin because each cell of the plant contains the gene that codes for the activated Bt toxin.[12]

Monsanto has devised a "resistance-management plan," requiring farmers who cultivate Bt crops to devote a portion of their field to non-Bt plants. They hope to create refuge zones so that if an insect becomes resistant to Bt, it will not mate with another Bt resistant bug and produce more resistant insects.[13] However, insects cannot detect borders between refuge and non-refuge areas. Environmentalists and scientists believe that resistance to Bt will increase with the use of Bt crops because insects are constantly exposed to the Bt, rather than to an occasional spraying. Also no means of enforcing the refuge system exists.

A recent study conducted by scientists from the Imperial College of London and the Simon Rodriguez University of Caracas, Venezuela found that Bt crops might actually enhance the nutritional value of a plant for insects that already have developed a resistance to it. They fed regular cabbage leaves and leaves treated with the Bt toxin to larvae of the diamondback moth that had developed resistance to Bt. The larvae that consumed the Bt-treated leaves experienced a 56% higher growth rate.[14] The scientists concluded that if an insect has already built up a resistance to Bt, then the Bt toxin protein can function as food, rather than an insecticide.[15]

Bt crops do not only kill or have adverse effects on the targeted insects but also several types of beneficial insects, like lacewings, monarch butterflies[16] and ladybugs.[17] Studies demonstrate that the lifespan and egg production of ladybugs are decreased, the survival rate of green lacewing larvae diminishes and that honeybee behavior is altered when these insects are exposed to Bt.[18] Swiss scientists showed that lacewings die when they feed on larvae of the European corn borer that have ingested Bt toxin.[19] Ladybugs and lacewings are critical for natural pest control and honeybees pollinate open pollinated crops, such as corn. It is unknown what effect the Bt has on microorganisms or insects in the soil, since the roots also contain the Bt toxin. Scientists based in Venezuela and New York found that the Bt toxin secreted from Bt corn roots remained bound to soil particles in its active, lethal state for more than seven months.[20]

A study conducted at Cornell University tested the effects of Bt pollen on monarch butterflies. The scientists fed monarch larvae milkweed leaves that had Bt pollen on them and fed a control group with non-GMO pollen. Only 56% of the larvae survived that were placed on the milkweed with the Bt pollen, while all the larvae on the control milkweed plant with non-Bt pollen lived.[21] The monarchs exposed to Bt consumed significantly less, demonstrated slower growth rates and their average weight was less than half the average weight of the unexposed larvae.[22] Iowa State University researchers found that 19% of monarch caterpillars died within 48 hours after feeding on milkweed plants that were growing in or on the edge of Bt cornfields.[23] In 2001, researchers from the USDA and several midwestern universities published a study that biotech industry scientists claimed refuted the earlier monarch butterfly studies. However, this study found that at least one variety of Bt corn was lethal to monarchs under rigorous field conditions, and the researchers chose not to pursue evidence of developmental problems and other sublethal effects

from Bt corn pollen.[24]

Problems with Bt have been experienced higher up on the food chain as well. Farmers in Iowa have reported that pigs fed with Bt corn have exhibited behavioral and physical signs of pregnancy even though the pigs were not really pregnant, rendering it impossible to breed the pigs. One farmer from Iowa, Jerry Rosman, witnessed an 80 percent reduction in his pig litters after he started feeding them Bt corn. His pigs went through the normal 113-day gestation period of pregnancy but no fetuses existed. After the gestation period the pigs shrunk back to their pre-pregnancy size and no signs of pregnancy remained. Then the pigs went back into heat in 14 to 30 days and repeated the pseudopregnancy cycle.[25] Four other farmers in the region noticed similar problems. The only farming practice that all these farmers shared was that they all fed their swine Bt corn. One of the farmers stopped feeding his pigs Bt corn and the pigs were able to become pregnant again.[26] In the last two years more than 20 farmers have reported problems with false pregnancies in their swine after feeding them Bt corn.[27] The examples of the dangers of Bt discussed above are only the consequences that have already been documented. Unfortunately more short- and long-term problems are sure to arise.

Herbicide Tolerant Crops

Several corporations have genetically altered crops that are resistant to herbicides. Glyphosate is the most commonly used broad-spectrum herbicide, an herbicide that kills all leafy plants (as opposed to plant-family specific herbicides). Roundup, Monsanto's version of glyphosate, inhibits the functionality of enzymes inside a plant that are required to synthesize certain amino acids, killing the plant. Roundup Ready crops are genetically engineered to contain a resistance to the herbicide Roundup, usually by inserting genes from bacteria that will prevent the herbicide from affecting the crop. These are the most common type of GE crops grown today.

One of Monsanto's main public relations campaigns argues that genetic engineering will reduce herbicide use, but their Roundup Ready products contradict this statement. The application of different varieties of glyphosate has increased by two and a half times since Roundup Ready crops were first introduced in 1996.[28] Farmers who cultivate Roundup Ready crops can spray as much glyphosate as they desire and their resistant crops will not die, only the weeds around them will die, unless they also build up a resistance to Roundup. This resistance has only increased the amount of herbicides being used in agriculture[29] and stronger herbicides are then required to kill weeds that develop herbicide tolerance. This has already occurred in the US states of Delaware, Maryland, California, Tennessee, Ohio and Indiana.[30] Two weeds in particular, mare's tail and water hemp, have built up a resistance to the spraying of Roundup.[31] Monsanto instructs farmers to continue to use Roundup and also apply another herbicide to kill the resistant weeds.[32]

Due to cross-pollination of several varieties of herbicide tolerant canola (rapeseed), farmers in Alberta, Canada have found canola plants that are simultaneously resistant to as many as three different types of chemical herbicides (Roundup, Liberty, and Pursuit).[33] This triple resistance developed after just two years of cultivating herbicide tolerant canola varieties.

Approximately 75% of US soybeans are Roundup Ready, 65 % of US cotton and 10% of the corn.[34] Monsanto's Roundup Ready crops that are available for retail use include: corn, sugar beets, canola, cotton, and soybeans. Monsanto is currently developing Roundup Ready wheat, turf grass for golf courses, and alfalfa.

Many health and environmental complications exist with the application of glyphosate. Toxic reactions occur in mammals when exposed to glyphosate, including convulsions and cessation of breathing. Genetic and reproductive damage has been found in many species that are exposed to glyphosate.[35] Some of the "inert" ingredients have caused acute toxicity and have had the following results: gastrointestinal pain, vomiting, excess fluid in the lungs, pneumonia, destruction of red blood cells, and destruction of the mucous membranes and upper respiratory

tract.[36] Japanese researchers studying cases of suicide or suicide attempts from the ingestion of glyphosate determined that drinking a little more than 3/4 of a cup of glyphosate would be fatal for humans.[37]

Glyphosate in the soil remains active and absorbs into soil components. Residue from the herbicide has been discovered on lettuce, carrots, and barley a year after Roundup was used in the same field.[38] Glyphosate not only kills plants, but also beneficial insects like parasitoid wasps, lacewings, and ladybugs and greatly affects earthworms and beneficial fungi. Transgenic Roundup Ready canola has harmed bees' ability to recognize flower smells, making it hard for them to find the plants they prefer and pollinate them.[39] Roundup inhibits nitrogen fixation, an important process for regenerating the soil.[40] Plants that are exposed to glyphosate are more susceptible to disease.[41]

Terminator Technology

Monsanto's genetically engineered seed packages come with a contract, which states that farmers may not save their seed because Monsanto owns the patents on it. It also demands that farmers buy new seed each year from Monsanto if they wish to grow their patented varieties. Monsanto posts signs and threatens investigations if they discover that farmers are saving seed. Monsanto, the USDA, and other biotechnology corporations are developing another way to enforce this rule, the Terminator technology. Terminator seeds have a suicide mechanism that is triggered by various outside stimuli. If a seed tries to germinate, it will automatically self-poison.

Since the seeds are not fertile, seed saving is impossible. Seed saving is crucial for food security in many parts of the world. The threat posed by Terminator technology contradicts Monsanto's claim that GE crops will feed the world. The industry's public relations campaign also states that Terminator technology will prevent cross-pollination of GE crops with non-GE crops, thereby controlling the genetic drift of DNA from such organisms as Bt corn. However, if Terminator crops cross-pollinate with neighboring crops, the harvests of these crops could inherit the Terminator characteristic and become sterile, eliminating the possibility of seed saving. Terminator technology enforces the reliance on buying seeds from transnationals and undermines indigenous peoples' and farmers' rights to save seed. Even though Terminator technology has been stopped from being released onto the market for the time being, Monsanto and other biotechnology corporations are still developing it and hoping to release the technology.

Pharmacrops

GE crops are now being grown to produce pharmaceuticals and industrial enzymes. For example, Epicyte is producing a type of corn that will contain a spermicide.[42] Biotechnology corporations prefer to use corn as an agent to produce pharmaceuticals because it is relatively easy to genetically alter and simple to store, transport, and cultivate.[43] Corn also produces large quantities of proteins, which can be used for industrial enzymes and drugs.[44] In July 2002, the GE Food Alert Coalition discovered over 300 secret field trials of pharmacrops. Scientists engineered some of these plants to produce abortion-inducing chemicals, growth hormones, and vaccines.[45]

In the 2001 planting season, ProdiGene was responsible for the planting of genetically engineered corn that contained pharmaceuticals, including a pig vaccine, in field trials in Iowa and Nebraska. ProdiGene did not properly clean up the cornfields after harvest. In Nebraska the following year, the farmers cultivated soybeans and old ProdiGene corn seed that had not germinated the year before sprouted and contaminated the 2002 soybean harvest. Traces of the corn were found in 500 bushels of soybeans. These were sent to a grain elevator in Aurora where they mixed with 500,000 bushels of soybeans. ProdiGene was forced to purchase and destroy all these soybeans for $2.8 million.[46] In Iowa, ProdiGene destroyed 155 acres of corn because it may have cross-pollinated with 'pharmacorn' that had sprouted in a test field from the previous

harvest season.[47]

On March 6, 2003 the USDA passed stricter regulations on the cultivation of genetically engineered crops. Now pharmacorn must be grown one mile away from agricultural food corn. The food industry (afraid of cross-pollination with their food crops) and anti-GE activists both stated that these regulations were not strict enough.[48] Corn easily cross-pollinates, and its pollen can drift up to a mile.[49] Most farmers believe corn pollen can drift much further with wind and the assistance of insects. The biotechnology industry even suggested outlawing the cultivation of pharmacrops in the US Corn Belt to protect field corn but Midwest politicians opposed this. Drawing from the example of ProdiGene, other cases of contamination of field crops with pharmacrops have likely occurred and have not been detected.

Cross Pollination and Threat to Biodiversity

Several environmental risks of GE crops have already been mentioned. Unfortunately, not enough research has been conducted to know all the short- and long-term effects of cultivating GE crops. One of the most daunting consequence of genetic engineering is genetic contamination. Genetically engineered crops can be classified as a "living pollution" because they can reproduce themselves. Once a GE crop exists in the environment, its pollen—containing unique combinations of genetic traits whose long-term effects have not been studied—can be passed on, causing contamination in other plants from the same species. These newly contaminated plants can then reproduce the pollution, and so on. Bumblebees, monarch butterflies and many other insects do not know the borders of a conventional farm that grows Bt crops from the borders of an organic farm, other conventional farms or a wild field. These insects take pollen from sources and will pollinate plants indiscriminately.

The reproductive barriers between related species of plants are much less stringent than in animals, so it is possible for genes to be transferred between plant species. Related species often live close to each other, which also facilitates cross-pollination. Genes from various crops have been found a half-mile from where they were cultivated. These genes can persist in these new areas for generations and also spread to other areas.[50]

Examples of cross-pollination of GE crops with non-GE crops are abundant throughout the world.[51] Prima Terra, an organic corn chip company, was required to pull their products from the shelves in Holland when GE traces were discovered in them. The contaminated corn was traced back to an organic farmer whose corn was cross-pollinated by his neighbor's Bt corn.[52]

In 1999 and 2000, Michael Vayda from the Department of Biochemistry, Microbiology, and Molecular Biology at the University of Maine and John Jenison, an agronomist, conducted experiments to determine the rates of cross-pollination with plots of GE corn and conventional corn. In the 1999 trial, cross-pollination occurred at a rate of 1% or lower in conventional plots that were 100-300 feet away from the Roundup Ready cornfield. The rate of cross-pollination decreased in relation to distance from the GE field. In 2000, the results were complicated because the conventional seed that the researchers purchased, which was supposed to be GE-free, was found to have traces of GE material.[53] Oaxaca serves as the most tragic example of cross-pollination, where 8% of the indigenous corn is contaminated with DNA from GMOs (*See The Case of Oaxaca, page 15*).

Human Health Risks and GMOs

Almost all GE foods contain "antibiotic resistance markers," which are inserted to determine whether the new genetic material was transferred or not. The insertion of the antibiotic resistance markers can lead to the antibiotic resistance genes being transferred into the environment, animals

and the bacteria that inhabit the human gut. One of Novartis' genetically engineered corn plants was resistant to ampicillin, which is used to treat infections in humans and other animals.[54]

Food allergies are confirmed in 8% of children and 2% of adults in the United States.[55] Genetically engineered foods can transfer food allergies from one food to another as genes from one species (a potential allergen) are placed into another, without labeling the transfer. GMOs are likely to be creating more unknown allergens since new bacteria, viruses, promoters, and vectors are introduced into plants. When a gene from another plant/animal/bacteria is inserted into our food, it is uncertain what kind of effect that will have on the human body. New chemicals could be formed that are toxic to humans.

Even scientists at the US Food and Drug Administration (FDA) have warned about the potential dangers of toxicity. The Flavr Savr genetically engineered tomato caused lesions in lab rats. In 1990, 27 people died and 1,500 became ill from L-trypotophan, a genetically engineered dietary supplement.[56] Genes from Brazil nuts were introduced into soybeans, supposedly to improve the nutritional content of the soybeans. Some people have fatal reactions to Brazil nuts. Blood samples from people with Brazil nut allergies demonstrated an allergic reaction in the presence of these GE soybeans, so luckily these soybeans were recalled before they entered the market. However, what would have occurred if these soybeans had hit the market? The best-known case of a likely allergen contaminating our food involved the insecticidal StarLink corn. (*See The Case of StarLink, page 11*).

Since genetic engineering alters the constituents of food, many scientists affirm that it also alters the its nutritional value. Even the FDA's Division of Food Chemistry and Technology and Food Contaminants Chemistry warned in 1992 that GE would reduce the nutrient value of foods. Dr. Arpad Pusztai, a lectin specialist at the Rowett Research Institute (RRI) in Scotland conducted a study to determine the potential health effects of potatoes that contained a genetically engineered insecticidal compound (lectin). Pusztai fed the GE potatoes to rats to evaluate their metabolism and organ development and compared this with a control group that was fed non-GE potatoes. The amounts of protein, sugars and starch in the GE potatoes varied as much as 20% from the non-GE potatoes.[57]

The rats fed with GE potatoes also witnessed significant changes in the sizes and weights of their intestines, pancreas, kidneys, liver, lungs, and brain. There was also evidence of intestinal inflammation and infection and a suppressed immune system.[58] Other potatoes were directly sprayed with the same lectin that was genetically engineered into the GE potatoes. The rats that ate the sprayed potatoes did not exhibit any of the same effects of genetically engineered potatoes.[59] This led Pusztai to conclude that the effects were associated with the DNA constructs that these experimental GE potatoes share with other GE foods. After Pusztai went public with his results, RRI criticized Pusztai's work and subsequently fired him. The publicity from this case helped educate people in Britain and throughout Europe of the potential dangers of GE foods.

The Case of StarLink

The massive contamination of the world's corn supply caused by StarLink serves as one of the most tragic examples of cross-pollination and mixing of seed lots. StarLink corn genetically engineered by Aventis contains a Bt bacterial protein, Cry9C that cannot break down in the human digestive system and is classified as a potential allergen. The United States' Environmental Protection Agency (EPA) has only approved StarLink for cattle feed. In September 2000, activists with Friends of the Earth in the US discovered that Taco Bell brand taco shells were contaminated with StarLink corn. The FDA and the Center for Disease Control in the United States investigated forty cases of allergies induced by StarLink corn.[60] Eighty varieties of yellow corn seed were found to contain the Cry9C Bt protein. Many corn growers

converted to cultivating white corn, to avoid yellow corn contaminated with traces of StarLink. However in July 2001, white corn was discovered to have contamination also.[61]

In October 2000, the USDA recalled 350,000 acres of StarLink corn planted in the United States.[62] The corn was processed into taco shells at the *maquila* in Mexicali, Mexico, which also manufactures Sabritas Mexican snack foods. The US-bound taco shells and some 300 other corn products were recalled from the shelves but the Mexican Sabritas brand was not,[63] a gross example of environmental and health racism. In March 2001, the food biotech giant Aventis (whose crop division is now owned by Bayer) announced that 143 million tons of corn were contaminated, forcing farmers, seed companies, processors and food makers to spend over $1 billion to get rid of it.[64]

US federal inspectors found traces of StarLink corn in 10% of 110,000 grain tests conducted in the US between November 2000 and April 2001.[65] In this same time period, only 0.4% of the corn cultivated in the US was StarLink.[66] The increase occurred because of the mixing of varieties and through cross-pollination.[67] Aventis stated that it would take four years to clean up the StarLink contamination. They asked the government to determine a maximum standard of StarLink contamination that could be permitted in the human corn supply. A panel of scientists established by the EPA stated sufficient evidence does not exist to prove that any amount of StarLink is safe for human consumption.[68]

StarLink continues to be detected in countries throughout the world. In South Korea, 55,000 tons of corn that was certified StarLink-free tested positive[69]. Japan also discovered US corn imports tainted with StarLink[70]. Japan and South Korea are the two main importers of US corn in the world. Japan receives 22% and South Korea imports 11% of United States' corn exports. Food aid sent to Bolivia also tested positive for traces of StarLink corn.[71]

The Legal Risk to Farmers

Hundreds of lawsuits have been filed against US and Canadian farmers by Monsanto, which claims that the farmers are using patented seeds without Monsanto's permission. Percy Schmeiser, a farmer from Saskatchewan, Canada had his canola fields contaminated when his canola cross-pollinated with his neighbor's GE canola. Monsanto's agents/employees, acting as "gene police" illegally trespassed on his land and took samples of his canola to determine if their patented genes were present in his canola. They sued Schmeiser for US$125,000 for illegally growing their patented variety of GE canola without a license (called "patent infringement"), even though Schmeiser never intended to nor wanted to cultivate Monsanto canola.[72] In 2003, the Canadian Supreme Court agreed to hear Schmeiser's appeal.

Farmers cultivating any crop from Monsanto that contains patented genes who have not signed a contract with the corporation could risk legal action by Monsanto whether the farmer knows her/his crop contains GE material or not. Hundreds of farmers throughout the US and Canada have been sued or threatened by Monsanto and have settled out of court. Farmers throughout the world save their seed to cultivate the following year, stewarding their seed stock and developing new varieties. Intellectual property rights granted to seed manufacturers threaten farmers' and indigenous peoples' ability to save seed legally.

Monsanto has established a specific department to enforce its licensing agreements and GE seed patents with an annual budget of $10 million and 75 employees.[73] It has won several court battles against farmers, including one settlement of $2.5 million from an Arkansas farmer.[74] Kem Ralph, a soybean and cotton farmer was the first person sentenced to jail (for 8 months) for illegally saving Monsanto's seeds. Monsanto sends inspectors to farmers' fields to make sure they are not saving seed. It has also created a hotline number so people can anonymously turn in their neighbors if they suspect their neighbor may be illegally saving or using Monsanto GE seeds

without a license.

Under the new USDA organic standards implemented in 2002, if an organic farmer's crop cross-pollinates with a GE variety, the organic farmer cannot sell the product as organic or feed it to any animals she/he is raising organically. So if organic farmers grow their own grain to feed to their cattle and that becomes contaminated with DNA from GMOs, the farmers must buy organic grain from another supply to field the cattle.[75] Cross-pollination with GE crops jeopardizes the fastest growing agricultural sector in the United States, organic farming. Genetically engineered crops and organic farming are not compatible.

Part 2: "Free" Trade in Mexico and Central America

Whom is "free trade" free for? Small- and medium- sized farmers, workers, and indigenous people? No, of course not. It is free for corporations and investors because taxes on imports and exports are eliminated through the process of free trade. Free trade makes it easier for TNCs to move goods and services across borders, while placing more restrictions on the flow of people across borders.

Free trade agreements do not actually promote "free trade" as defined by its founder Adam Smith, who advocated for the uninhibited flow of goods and services. Free trade agreements initiated by the United States maintain many restrictions on trade to favor US products and corporations. For example, the United States demands that its own agricultural subsidies remain in place while other countries must eliminate tariffs and import quotas. The United States often uses free trade agreements as a mechanism to protect US agriculture and industry.

Fast Track to US Protectionism

An example of US protectionist policy is evident in the latest "Fast Track" bill (now called Trade Promotion Authority) passed in 2002. Under Fast Track, the US Congress must vote an entire trade agreement up or down with no room for amendments. Congress is only given 60 days to review the agreement. This is not sufficient time to read a document that is usually between 1,000 to 2,000 pages in length and full of trade jargon. The House and Senate are given 20 hours each to debate the agreement. Fast Track allows the United States to negotiate "free trade" agreements that require other countries to remove their barriers to trade while allowing the United States to keep subsidies and tariffs on sensitive agricultural products.

Under the latest Fast Track legislation approved in 2002, agriculture has come under attack with new provisions not previously seen in US legislation. Congress must now authorize all tariff reductions on import sensitive agricultural products that are negotiated outside of the WTO. Therefore, US Trade Representatives must now consult the Senate and House agriculture committees before and during negotiations. These provisions do not offer public transparency but rather alert Senators, Representatives and agribusiness about latest trade agreements so that they can ensure that their own concerns will be addressed. This provides agribusinesses with ample time to lobby to keep tariffs in place on agricultural imports into the United States.[76] Agribusiness demands less market access for imports into the US and opposes anti-dumping measures. Dumping provides an outlet for cheap, US-subsidized products to saturate local markets, which skews the market to favor US products over local goods. Agribusiness will be given notice if sensitive agricultural products are included in free trade agreements so they can lobby to remove

these products from the agreement.

The new Trade Promotion legislation allows the United States to block "anti-dumping" laws, even though WTO and FTAA countries demand that the United States not be able to dump agricultural products on markets throughout the world. The latest Fast Track bill also seeks to prohibit countries from regulating imports of GE products from the United States. The objective of this part of the bill is "developing, strengthening, and clarifying rules and effective dispute settlement mechanisms to eliminate practices that unfairly decrease US market access opportunities ...including... unjustified trade restrictions or commercial requirements, such as labeling, that affect new technology, including biotechnology."[77]

The North American "Free" Trade Agreement

Mexico, the United States and Canada began implementing the North American Free Trade Agreement (NAFTA) on January 1, 1994. A basic premise of NAFTA is the elimination of barriers to trade, like tariffs and quotas, because they impede investors' and corporations' ability to make profits. NAFTA establishes new rules and regulations that replace or overturn existing rules and regulations on trade. Supposed barriers to trade include laws that protect the environment, labor, indigenous rights, food safety, women's rights, agriculture, and local economies.

Before NAFTA was implemented, Mexico, Canada and the United States had to revise and rewrite existing laws to comply with NAFTA. The revision of Article 27 of the Mexican Constitution impacted the *campesinos* (those who embody a rural lifestyle) and indigenous people most drastically. Before Mexico could join NAFTA, Article 27 was rewritten to enable the privatization of the *ejido* (communally worked) lands so that Mexico's property laws would more closely resemble those of the United States and Canada.

January 1, 1994 also marks the beginning of the Zapatista uprising in Chiapas, Mexico. The Zapatistas rose up against neoliberal economic policies like NAFTA and the revisions to Article 27.

Under NAFTA and other trade and investment agreements no country can favor local producers or markets over foreign investors. Countries must provide the same access to transnational corporations as to locally owned businesses. NAFTA's "national treatment" provisions forbid countries from regulating and preventing the entrance of transnational corporations. This promotes the displacement of local businesses and small- and medium-sized producers, especially in low-income countries that cannot compete with large transnationals.

Each NAFTA government made specific promises of economic prosperity to their constituencies to ensure that NAFTA would be implemented. Two side agreements on labor and the environment were added in 1993 to appease concerns that NAFTA would endanger the environment and the rights of workers. However these side agreements have no enforcement mechanism and have done nothing to protect the environment or worker's rights.[78]

President Salinas told the Mexican public that NAFTA would carry Mexico from the "third world" into the "first world." The Mexican government promised development, jobs, less poverty, and economic growth for Mexico, none of which has come to fruition. By 1997, working class salaries fell to 60% of their 1994 value.[79] The number of Mexicans surviving on less than $2 a day increased by 4 million between 1994-1997.[80] In 1997, nearly 8 million Mexicans were documented as earning under the minimum wage of $3.40 a day.[81]

NAFTA's Chapter 11: The Investor-to-State Dispute Resolution Regime

Chapter 11 of NAFTA on investment enables corporations or investors to sue member governments if a law (at the municipal, state, or national level) impedes trade or a corporation's potential for investment/profit. These "regulatory takings provisions" permit corporations to demand compensation for any government's policies, laws or actions that actually or potentially result in a loss of profits. For example, if a government passes a law requiring strict pollution controls, a transnational corporation that owns a polluting factory (from a different country) can sue the government for compensation if the costs of cleaning up cut into its profits.

Chapter 11 protects the rights of investors and corporations, while placing the risk of investment on municipal, state and national governments and ultimately the people. Corporations receive this protection even though they are not signatories to NAFTA and are responsible for pollution and human rights abuses. NAFTA Chapter 11 tribunals are held in secret and do not fully disclose their decisions. Members of the tribunal are usually not known to the public and are comprised of trade lawyers and officials. Once a law is challenged under NAFTA, the tribunal's only responsibility is to rule whether the law violates NAFTA, not to take into account the effect on the environment, indigenous people, democracy or labor.

One example of a NAFTA tribunal involved US-based Ethyl Corporation and the Canadian Government. Ethyl Corp. manufactures a gasoline additive called MMT, which reduces the knocking sounds in engines and acts as a lead substitute. However, manganese, one of the ingredients found in MMT, is suspected to cause brain damage in children. MMT also inhibits the function of catalytic converters.[82] Canada banned the importation of MMT in 1997. Ethyl Corp. did not agree with this decision and they sued the Canadian government for $250 million in compensation fees under the NAFTA tribunal because their ability to make a profit was obstructed. The CEO of Ethyl also claimed that the ban on MMT was damaging Ethyl's reputation. It became evident that the NAFTA tribunal would rule in favor of Ethyl, so Canada settled outside of the tribunal to escape the potentially high compensation fees. Canada overturned their ban and paid Ethyl Corporation $13 million.[83]

NAFTA has caused environmental and indigenous rights laws to be modified or eliminated and this trend will only continue. The MMT ban in Canada and Article 27 of the Mexican constitution are just two examples. If Monsanto wanted to challenge Mexico's moratorium on the cultivation of genetically modified corn under NAFTA's Chapter 11, it would be entitled to compensation fees. Furthermore, if the Mexican government decided to outlaw the importation of genetically engineered corn or require labeling of genetically modified products, it could be challenged under Chapter 11.

The Case of Oaxaca: How Free Trade and GMOs Interface

The genetic contamination of indigenous corn varieties in Oaxaca, Mexico serves as the most explicit example of how free trade (through NAFTA) and GMOs interface. This catastrophe must serve as a warning call to farmers throughout the world.

Campesinos and corn have a symbiotic relationship. Without the other, neither could survive. The lifestyle of the *campesino* depends on corn, which provides their nutrition, economic livelihood and a basis for many religious ceremonies. Mexican *campesinos* maintain current varieties and facilitate the evolution of new ones. New varieties will evolve only if farmers remain the stewards of corn and the protectors of biodiversity. There are over 20,000 varieties of corn in Mexico and Central America.[84] In southern and central Mexico, researchers have

identified 5,000 varieties.[85] Each variety has evolved to adapt to elevation levels, soil acidity, sun exposure, soil type, and rainfall. In 1998, the Mexican Congress passed a moratorium on the cultivation of genetically engineered corn to protect indigenous varieties. Unfortunately in April 2003 the Mexican congress passed legislation legalizing the commercial cultivation of genetically modified crops.

David Quist, a graduate student at the University of California at Berkeley and Ignacio Chapela, professor of Environmental Science, Policy and Management at the University of California at Berkeley, discovered that indigenous corn varieties from Oaxaca contained DNA from GMOs.[86] Their findings prompted two Mexican governmental agencies, the National Commission on Biodiversity (Conabio) and the National Ecological Institute (INE), to sample indigenous corn from twenty communities in Oaxaca and two in Puebla (another state in southern Mexico). They found that 95% of these communities (21 out of 22) had a 1-35% contamination rate, meaning that between 1% and 35% of the indigenous kernels they sampled contained traces of DNA fromGMOs.[87] In total, 8% of the 1,876 of the seedlings they tested were polluted by GMOs.[88] At the Biosafety Conference that convened in The Hague, Netherlands at the end of April 2002, Jorge Soberon, director of Conabio, declared this the worst case of GMO contamination in crops ever reported in the world. If there is an 8% genetic contamination rate in Oaxaca, Mexico where it was illegal to grow GE corn, then what is the contamination rate in countries like the United States and Canada where it is legal?

As genetically modified corn, such as Bt or Roundup Ready corn, cross-pollinates with indigenous corn varieties, the DNA from GMOs could interfere with the expression of unique physical characteristics and genetic predispositions, making the indigenous corn less suitable for its particular environment. As indigenous corn varieties lose their ability to produce in southern Mexico, yields will decrease and the *campesinos*' livelihoods will be undermined. The development of new locally appropriate corn varieties is also threatened by this pollution. The biotechnology industry has countered the negative publicity and asserted that the GE corn will increase biodiversity because it introduces new genes into the environment.

Research must be conducted to ascertain what effects the Bt corn will have on insects and soil microorganisms in Oaxaca. As Bt corn cross-pollinates with indigenous varieties of corn, the pollution will only replicate itself, causing more damage to insects. Also, the genetically altered corn could cross with *teosinte*, the wild ancestor of corn, which grows in and around the edges of cornfields in southern Mexico[89]. The distinct genetic composition could be lost in *teosinte* and other relatives of corn as they cross-pollinate with corn that contains DNA from genetically engineered organisms.

Farmers cultivating any crop that contains patented genes risk legal repercussions from transnational corporations who have not signed a contract with the corporation. This is true whether the farmer knows her/his crops contain GE material or not. The Mexican government does not currently honor Monsanto's patents but this is likely to change under future trade agreements or even existing ones. If this were to occur, the transnational corporations, which own the genetic patents, could sue farmers who have indigenous corn varieties that have cross-pollinated with genetically altered corn. Some industry scientists even claim that Mexican corn farmers are benefiting from the "free" DNA transfer and should have to pay for it.

The Genetic Contamination in Oaxaca: One of NAFTA's Horror Stories

The contamination in Oaxaca was directly caused by NAFTA, which allowed for unlimited imports of US corn, 30-40% of which was genetically modified.[90] Before NAFTA Mexico was practically self-sufficient in corn production and today is a major importer of corn. While NAFTA was being negotiated a comparative advantage analysis was conducted between the three

signatory countries to determine what each should produce for export. Ironically, Mexico was not chosen to grow corn, even though it is the center of origin of this crop. Instead the United States was selected to produce corn and other basic grains since it controls "Green Revolution" technologies, like chemical fertilizers, pesticides, hybrid seeds, irrigation, and mechanized equipment. The comparative advantage indicated that Mexico should cultivate labor-intensive horticultural crops, since it has a large cheap labor force.[91]

There was an assumption that there would be unlimited access for Mexican horticultural products into the United States, yet Mexico already accounts for more than 60% of the horticultural imports into the United States and US growers can supply many of these products for significant portions of each year.[92] This comparative advantage analysis also failed to take into consideration the impacts it would have on the *campesino* way of life in Mexico and the survival of corn biodiversity.

Additionally, the large subsidies that US corn farmers receive from the US government were overlooked, which underscores the US contradictions of "free trade." Some US corn farmers receive 42% of their income from government subsidies.[93] Farmers in the United States on average receive 30 times more subsidies than Mexican farmers.[94] In 2002, the US government passed legislation to provide an increase of $40 billion for subsidies to large grain and cotton farmers.[95] Large-scale farmers receive a disproportionately large amount of subsidies. Medium-sized farmers in the US depend on subsidies to survive, without them their farms would go under. This dependence on subsidies has been created by the falling prices of agricultural products on the global market.

NAFTA facilitated the further liberalization of the corn market in Mexico. The Agricultural Agreement of NAFTA, Chapter 7, eliminated all tariffs on agricultural goods either immediately or in a 5, 10, or 15-year period. NAFTA established a duty-free quota system or a protection period for corn with a 15-year phase out. In the first year of NAFTA 2.5 million metric tons of corn were permitted to enter Mexico from the United States, tariff-free. The amount the US could export without paying tariffs was to increase 3% annually for fourteen years, completing the 15-year phase-out period. Corn imports from the United States that surpass the duty-free quota are supposed to be subjected to a tariff.

This phase-out period, however, did not last for the anticipated time. In 1996, corn imports exceeded the quota by over 3 million tons and all tariffs were waived. Every year since the implementation of NAFTA (with the exception of 1995) exports from the US have gone beyond the quota and tariffs were not applied. Over $2 billion of fiscal revenue was foregone between 1994-1998 in Mexico because tariffs were never collected from the corn that exceeded the quota rate.[96] Since the Mexican government did not impose the tariffs, US corn exporters were given the green light to send their subsidized corn to Mexico.

After months of farmer protests, including blocking roads, dumping produce and grain in Mexico City, and herding animals into government offices, Mexican President Vicente Fox recently made vague promises that he would try to re-negotiate tariffs on white corn and beans with the US and Canada. Fox did not agree to the farmers' principal demand, to repeal NAFTA.[97] El Campo No Aguanta Más (The Countryside Can Take No More) comprised of over 100 organizations from throughout Mexico have three demands for Fox – to stop foreign imports of corn, to renegotiate the agricultural agreement of NAFTA and to take corn and beans out of NAFTA.[98]

Since 1998 until recently there has been a moratorium on the cultivation of GE corn in Mexico. Before NAFTA was implemented, the US exported approximately 2 million metric tons of corn annually to Mexico. In 2001, Mexico received 6.2 million tons of imported corn from the US,[99] more than tripling pre-NAFTA rates. It is estimated that 26% of the corn grown in the US in 2002 was genetically modified.[100] Both the European Union and Japan maintain restrictions on

the import of GE foods, which disproportionately increases the amount of genetically engineered grains the US exports to other countries. An estimated 30-40 percent of the corn exported from the United States to Mexico is from GE varieties.[101]

The primary direct source of the genetic contamination in Oaxaca came from the imported corn from the US. Diconsa, a Mexican state-run grain distributor, facilitated the dispersion of this genetically altered corn. Diconsa delivers grain and other supplies to stores throughout rural areas of Mexico. According to Manuel Mérida from the Diconsa warehouse in Oaxaca City, 40% of the corn distributed by Diconsa in 2001 in Oaxaca originated from the United States.[102] The Mexican Commission on Biodiversity (Conabio) and the National Ecological Institute (INE) found a 37% GE contamination rate in the corn in the Diconsa warehouse in Ixtlán (of the Sierra Juárez).[103] Nonetheless a worker at the Ixtlán store, which supplies the Sierra Juárez region in Oaxaca, reported that a representative from Diconsa informed her there were no GMOs in the Diconsa corn in the store.[104] Another worker at the Guelatoa Diconsa store was told "GE corn is colored and Diconsa only sells white corn, so there is nothing to worry about."[105] There are no signs in the stores warning *campesinos* not to cultivate the Diconsa corn, even though it is highly tainted with DNA from GMOs. Six workers at Diconsa stores throughout the Sierra Juárez stated that *campesinos* know not to plant Diconsa corn and only cultivate their *criollo* (indigenous) varieties. However, two of the twenty-nine campesino families interviewed admitted they had at one point experimented with Diconsa corn.[106]

Diconsa corn has made its way into the ground through many avenues. For centuries, farmers have conducted agricultural experiments. A few *campesinos* in the Sierra Juárez tried planting Diconsa corn, since they had never been informed of its dangers. Diconsa corn falls off trucks during delivery and grows on the side of roads. Also, the Diconsa corn that is used as livestock feed often ends up germinating when the animals do not consume it all. Mexican scholars fear that if the corn can reach rural areas such as the Sierra Juárez then other areas throughout Mexico must also have contamination.[107]

Diconsa corn is now cross-pollinating with *criollo* varieties and has become a direct source of contamination. Even if imports of genetically modified corn stop, cross-pollination will continue to be a direct source of pollution. Other potential sources of contamination include illegal planting by transnational corporations, government distribution of GE seed, and international food aid. None of these possibilities have been confirmed and need further research.

Another underlying cause of the contamination is the lack of understanding *campesinos* have about GMOs. Seventeen out of 29 campesino families in the Sierra Juárez had heard of GMOs but only 4 families interviewed actually knew that genetic engineering involves the transfer of genetic material from one species to another.[108] Neither the Mexican Secretariat for Agriculture, Livestock, Fisheries and Food (SAGARPA) nor Diconsa are taking steps to educate the campesinos that corn in their area is polluted with DNA from genetically engineered organisms. Aurelio Bautista, a technician from SAGARPA in Calpulalpan (a village in the Sierra Juárez) stated that he believes the contamination in the Sierra Juárez is only a rumor.[109] Even though government agencies have taken samples from Calpulalpan and it is one of the most highly publicized communities that has GE corn contamination, Bautista nervously insisted in an interview that Calpulalpan did not have polluted corn.[110] These types of blatant misstatements have led to further misunderstanding and misinformation about genetically modified organisms in Oaxaca.

NAFTA has enabled GE corn to enter rural Mexico, encouraging *campesinos* to abandon their land because it has become cheaper to buy tortillas than grow corn. This has resulted in an increase in corn imports. Corn from the US is sold on the Mexican market for 25% less than its cost of production.[111] Heavily subsidized US imports have flooded the Mexican corn market and driven down the price of corn, undermining the *campesinos*' ability to make an economic

livelihood.

Umberto Rosales, an engineer from SAGARPA, stated in an interview that Mexican *campesinos* should produce higher yields of corn, cultivate a more profitable crop or leave the land.[112] Over 600 *campesinos* in Mexico are reported to leave their land daily due to the cheap imports of corn from the United States.[113] Since NAFTA was implemented in 1994 over 1.8 million Mexicans have lost their jobs in the rural areas.[114] Now the US is seeking to pass CAFTA and the FTAA, which will spread the contamination of corn throughout the Americas and Caribbean by extending the same NAFTA-esque conditions that led to the genetic pollution in Oaxaca.

The FTAA: Reinforcing the Monroe Doctrine

Since 1994 the US has pushed for a free trade zone that would extend from northern Canada to the Tierra del Fuego in Chile, expanding NAFTA and reinforcing the Monroe Doctrine, which was issued in 1823 and declared that Latin America and the Caribbean were under the sphere of influence of the United States, not Europe. The Free Trade Area of the Americas (FTAA) would consist of 34 countries from the Western Hemisphere, encompassing all countries in North, South, and Central America and the Caribbean with the exception of Cuba. The FTAA not only expands NAFTA geographically but also with respect to trade and investment policy. Just as with NAFTA, the negotiators of the FTAA promise to deliver better living and environmental standards to the entire hemisphere, regardless of the size of a country's economy. However, the FTAA plans to include an investor-to-state dispute settlement regime, similar to the one present in NAFTA.

The FTAA has declared four official languages for their negotiations, the languages of the colonizers, Portuguese, Spanish, French, and English. This automatically excludes millions of indigenous peoples from throughout the Western Hemisphere who do not speak one of these languages, even though, as NAFTA has shown, they will be the most affected by the FTAA. Obviously indigenous peoples have no voice in the FTAA.

The services provisions in the FTAA are modeled after the General Agreement on Trade in Services (GATS) at the WTO, which are designed to open sectors such as health care, education, postal services, telecommunications, water, transportation, energy, and many others to privatization by TNCs. The groundwork for this sort of trade liberalization in services has already been laid in many less industrialized countries by structural adjustment policies (SAPs) imposed by the World Bank and the International Monetary Fund. Under these SAPs, countries are forced to privatize public services and cut public spending (on healthcare, education, etc.) in exchange for loans.

The FTAA is far more ambitious than GATS and grants unfettered access to corporate investors to buy out services. The FTAA would limit governments' ability to regulate how transnational corporations run private services, and open the door to full-scale privatization of public services. Once a country privatizes a small segment of one service, it cannot restrict corporations' access to that service sector, either by domestic or transnational corporations. For example, if one state or province in a country privatized home care services, potentially any corporation in any member nation of the FTAA could privatize any and/or every part of the healthcare system in the country.

CAFTA: US Imperialism in Central America

Unlike the FTAA, Central America has no large economies, like Brazil or Argentina, that could form an economic bloc to counter US hegemony. Due to the large-scale resistance to the

FTAA and the possibility that it may not come to fruition, the US proposed the Central American Free Trade Agreement (CAFTA) with five Central American countries (Guatemala, Nicaragua, El Salvador, Honduras and Costa Rica). The US is in a position where it must negotiate trade agreements with fewer countries, including bilateral trade agreements (between two countries), to push its regional free trade agenda. The United States government recently affirmed that it is trying to secure bilateral trade agreements with Panama and the Dominican Republic, which could later be "docked" into CAFTA.

Thanks to Fast Track, the US is pushing the CAFTA negotiation process incredibly quickly. Negotiations started on January 27, 2003 in Costa Rica. Nine rounds of negotiations are scheduled for 2003 with the goal to finish by the end of 2003 and to begin implementation in 2004. The US stated that it took 20-22 months of negotiations for the Chilean bilateral free trade agreement to get to the point where Central America and US were in the negotiation process after only three months of talks.[115]

Bush's "War on Terror," has distracted the US public from even hearing of CAFTA. The Bush Administration promotes free trade as a mechanism to fight global terrorism, even though the United States has the military power and neoliberal economic policies to assert its dominance over entire regions. Bush has stalled signing the Chilean bilateral trade agreement because Chile did not support the US in the UN Security Council vote to authorize war on Iraq. The Bush Administration is effectively trying to "punish" countries that do not help in its "War on Terror." On May 6, 2003 the US signed a bilateral trade agreement with Singapore even though Chile completed negotiations prior to Singapore; the latter committed to sending police and health workers to help rebuild Iraq. If Central America joins the US fight against global terror, they will likely be "rewarded" with a trade agreement.

The US forced the Central American countries to sign a secrecy clause at the second round of negotiations in Cincinnati, Ohio, which obstructs detailed information on the CAFTA negotiations from being released to the public. The Bush Administration justifies the secrecy of the negotiations stating that if the texts were released, lawsuits might be filed against the administration, slowing down the process.

Even though the contents of CAFTA have not been made available, it will most likely resemble NAFTA, the FTAA and the bilateral trade agreement between Chile and the United States. An investor-to-state dispute resolution regime, as in NAFTA will most likely be included, as well as the further privatization of services, as in the proposed FTAA. US Trade Representative Robert Zoellick asserted that the investment provisions of CAFTA would mirror those of the Chile/US bilateral agreement, which does not permit protection against speculative investment unless an emergency has occurred.[116] The deregulation of speculative investment – the aggressive buying and selling of foreign currencies – was one of the causes of the Mexican peso crash in 1995. Upon entering the Organization for Economic Cooperation and Development (OECD) in 1993, Mexico was forced to deregulate "hot money" flows in and out of the country, making the economy vulnerable to the rapid withdrawal of speculative investment.[117]

The US is stalling on releasing the agricultural component of CAFTA to Central American negotiators because this is the most contested issue in Central America and if they delay, Central America will have less time to draft a counter-proposal. After intense pressure from the Central American trade representatives, the United States announced at the third round of CAFTA negotiations in El Salvador that the US would eliminate its export subsidies on agricultural products, but not production subsidies provided internally.[118] Just as under NAFTA, the United States is pushing to eliminate tariffs either immediately or in 5, 10 or 15-year increments.[119] The US is asking for immediate access to 70% of Central American products, meaning that 70% of US products could be exported to Central America without tariffs or other barriers to trade.[120]

Nicaraguan President Enrique Bolaños and Honduran President Ricardo Maduro demand that

sensitive agricultural sectors in Central America be protected. USTR Zoellick responded that all agriculture products would be included in the negotiations[121] (*See Fast Track to Protectionism, page 13*). The Central American negotiators have rejected the US proposal to liberalize the agricultural sector, demanding protection of corn, milk, cattle, chicken, rice, beans and other essential agricultural goods.

Also under CAFTA, the US is asking for a longer protection period for intellectual property rights (patents, trademarks, and copyrights), than the 20 years currently granted under the WTO. The US wants to increase the time to 30 years protection for agrochemicals and 25 years for pharmaceuticals. Under this provision no one could legally commercialize a generic pharmaceutical until 25 years after the brand name was released.[122]

The United States Agency for International Development (USAID) and the Inter-American Development Bank (IDB) are helping to push the negotiation process forward. IDB President Enrique Iglesias has worked with Central American negotiators to help build trade-negotiating capacity. USAID is contributing US $ 37.9 million for technical assistance and cooperation.[123]

The effects of CAFTA on Central America will be similar to what has happened to Mexico since the implementation of NAFTA. The negotiators of CAFTA promise development, decreased poverty, economic growth and higher employment rates, the same promises made to Mexico during the NAFTA negotiations. Unfortunately the exact opposite has come to pass in Mexico where there is higher unemployment, more hunger, increased poverty and more ecological disasters than before the passage of NAFTA. Central America can expect more of the same from CAFTA and the FTAA.

Sitting at the Negotiating Table

History demonstrates that corporate elites control the agenda for these free trade agreements. The American Business Forum (ABF) was formed in 1996 by over 1,000 of the hemisphere's business leaders to provide a mechanism for transnational corporations throughout the Americas to exert influence on the FTAA process. The ABF has had exclusive access to the negotiations at all levels. Since its formation, the ABF has been invited to present proposals at every meeting of the FTAA Trade Ministers and the FTAA negotiating group meetings. According to the ABF's website, "Input from the ABF's private sector has become part of the FTAA process...this formal integration of private sector concerns is unique in international trade policy negotiations."

Looking at all the promises made during the NAFTA negotiations to farmers, workers, and non-governmental organizations (NGOs), which never came to fruition, it is clear that trade negotiators represent investors and TNCs, not farmers, indigenous peoples, or workers. Under NAFTA, environmental and labor side agreements were attached to appease environmentalists and workers, but in reality have done absolutely nothing to protect the environment or workers.

Some NGOs or civil society organizations (CSOs) in both the north and south have felt it necessary to take part in the negotiation process of free trade agreements like the FTAA and CAFTA, to ensure their voice is heard. Other community-based organizations and grassroots social movements argue that sitting at the "negotiating table," legitimizes the process of negotiations and feeds official claims that the negotiation process is transparent, inclusive and democratic.

Ironically, most of the NGOs and CSOs that try to get a "seat" at the negotiating table ultimately do not want the free trade agreement to be implemented. However, history has shown that even if the trade representatives fulfill any request from NGOs and CSOs, the free trade agreement will ultimately proceed toward ratification, with negative consequences far outweighing any benefits from the negotiated concessions. A few Central American NGOs have rationalized their position stating that they believe CAFTA will be passed no matter what, so they

need to minimize its negative impacts. Social movements and community-based organizations in Central America, on the other hand, believe that if all that time was devoted to mobilizing people to completely oppose the free trade agreements that there would be a much larger bloc of people completely rejecting CAFTA and the FTAA and the chances of the free trade agreements being implemented would be much lower.

The Policy of Contamination

What better way to control the world's food supply than contaminating it with GMOs? If TNCs can pollute the entire world's production of basic grains with DNA from GMOs than there will be no possibility of regulating them. Or if they can convince the world that the contamination is so widespread —even if it is not— then the TNCs can still make the argument that regulation is unnecessary. If CAFTA and the FTAA are implemented, they will inevitably spread GE contamination throughout the Western Hemisphere, providing an excellent business opportunity for US transnational corporations. The corporations will have secured markets throughout Latin America and the Caribbean that will not be able to reject GE food imports from the United States because they will be locked into a free trade agreement. If GE corn imports cross-pollinate with local varieties of corn, as has happened in Mexico, the corn will become contaminated. Countries would not be able to label their products as GE-free. This could hinder their ability to export their corn or products that contain GE contamination to countries in the European Union and other countries that maintain restrictions on the importation of GE foods. In this manner US transnational corporations will be able to systematically control the markets of the region, determining where communities can and cannot export their products.

Corporations want to continue to spread GE contamination through cross-pollination and by the mixing of GE and GE-free seed lots, thus making it impossible to regulate GMOs on a global level. In January 2001, *The Guardian* of London stated, "You'd think that the North American agricultural export industry would have no choice but to bow to the demand: keep GE seeds far away from their unaltered counterparts and in general move away from the controversial crops. You'd be wrong. The real strategy is to introduce so much genetic pollution that meeting the consumer demand for GE-free food is seen as not possible. The idea, quite simply, is to pollute faster than the countries can legislate – then change the laws to fit the contamination."[124]

Corporations and Corn Dumping

A few corporations monopolize the corn supply in Mexico and Central America. Grupo GRUMA controls 70% of the tortilla market in Mexico,[125] through its Mexican subsidiary, Maseca. They are also the largest corn flour and tortilla producer in the world.[126] Grupo GRUMA's corn flour subsidiary for Central America is based in Costa Rica and has operations in El Salvador, Nicaragua, Guatemala, and Honduras. Grupo GRUMA dominates 80% of corn flour market in Central America.[127] In the US and Europe, Grupo GRUMA sells Maseca corn flour and Mission tortillas.

Archer Daniels Midland Corporation (ADM – "supermarket to the world") owns one third of Maseca's US operation[128] and 22% of Maseca's Mexican operations.[129] Since NAFTA was implemented, ADM has been able to increase its profit from $110 million to $301 million.[130] Grupo GRUMA controls 40% of ADM's corn flour mills in the US and had net sales of US $1.8 billion in 2001.[131] Cargill accounted for 40% of Mexico's grain imports and bought 10% of its harvest.[132]

Maseca's owner, Roberto González Barrera, "the King of the Tortilla", has been one of *Forbes* magazine's top Mexican billionaires for years.[133] During the Carlos Salinas

Administration, the government gave all its subsidized corn sales to Maseca, "freezing out the"*niztamaleros*" (pure corn tortilla makers), who now must purchase corn at a higher price. The market price of corn was higher than the subsidized price granted to the *harineros* (flour tortilla makers). In 1996, Maseca was provided a subsidy of $341 million, 47% of its gross sales.[134] This change in policy provided González with 52% of the national tortilla market.[135] To express his appreciation, González bought Salinas a jet to leave Mexico after his brother Raul was convicted of murder and countless other scandals.[136]

ADM is the leading "dumper" of basic grains onto Mexican markets, benefiting greatly from NAFTA. Maseca also reaps the benefits of importing cheap untaxed corn from the US. The US dumps its corn on the international market at prices below the cost of production. Cargill and ADM maintain a monopoly on the corn market so they pay US farmers less than $2 for a bushel of corn even though the corn costs an average of $3.40 a bushel to produce. The US government charges the remainder ($1.40 a bushel) to US taxpayers.[137] Tortilla prices were supposed to be reduced under NAFTA due to the cheap imports of corn. Unfortunately, tortilla prices increased by more than 483% between January 1994 and January 1999 with the average price increasing by more than 35% yearly.[138] As inflation proceeded after the passage of NAFTA, the price of corn per kilo also rose. In 1994 (the year NAFTA was implemented), Mexico produced 98% of its corn needs[139] and now has become a major importer. In the 2001-2002 growing season, Mexico imported 22% of the corn consumed.[140] After Japan and South Korea, Mexico is the third largest importer of corn from the US and Canada.

Maseca and ADM have a poor history with regard to GMOs. ADM was involved in the StarLink scandal that sent StarLink contaminated corn into Mexico through its Sabritas brand products (*See The Case of StarLink, page 11)*. In 2000 ADM announced it would not segregate its GE corn from its non-GE corn.[141] Maseca promised in 1999 that its tortillas would no longer contain genetically modified corn. However, according to Greenpeace Mexico, Maseca still uses GE corn imports from the US for its products sold in Mexico but does not utilize GE corn for its products distributed in the US.[142] The StarLink scandal and Maseca's policy both demonstrate the environmental racism that corporations perpetrate against Mexicans with the distribution of GMOs.

CAFTA's Brother: Plan Puebla Panama

Plan Puebla Panama (PPP) is the infrastructural brother to the FTAA and CAFTA. Proposed by President Vicente Fox of Mexico, the PPP is a 25-year "development" project that will stretch from the state of Puebla, Mexico through Panama at a cost of around $10 billion. Corporations write "free trade" agreements to create conditions to favor their investments and ensure profits. They also demand the physical infrastructure so they can exploit the regions' abundant resources. The PPP responds in kind to these demands deepening corporate dominance in the region.

The PPP will provide the infrastructure to ensure the feasibility of free trade. Railroads, dry canals, and five lane highways will facilitate the flow of goods and services across borders. Also included in the plans for the PPP are the consolidation and privatization of electricity into one regional energy grid, the proliferation of free trade zones, and increased militarization.[143] The Mexican government and the Inter-American Development Bank (the project's primary champions) promise that the PPP will bring development and prosperity to the region, the same empty promises offered by the free trade agreements. These roads, railroads, ports and energy grid will not help people that do not have vehicles or goods and services to offer. Rather the PPP will provide (mostly US-based) corporations with infrastructure at the expense of Central American tax dollars.[144]

One farmer from El Salvador stated, "These roads will only bring in the trucks that will run us

over, they are not going to help the *campesino.*"[145] Another *campesino* said, "The only advantage *campesinos* will see on this road is the increased presence of buses and trucks that we can sell chewing gum to."[146] These roads will open up more rural areas of Mexico and Central America to industrial agriculture and the further influx of genetically engineered foods, especially corn. With CAFTA and the FTAA, the PPP will help contaminate indigenous and local varieties of corn throughout Central America, just as in Oaxaca, Mexico.

In Santa Cruz Michapa, a town to the east of San Salvador, one of the PPP roads under construction cuts right through the town. A 2001 earthquake destroyed approximately half the houses in this community. To this day most people live in houses built of aluminum siding, while millions of dollars are invested into the construction of the PPP highway. The construction of the highway knocked out the potable water system of the village, leaving everyone without water to drink or bathe with. At the same time huge truckloads of water are being sprayed on the road to keep the dust down. The contrast is horrific. The money being used to construct the highway could be used for housing and water, instead of corporate welfare.

Promoters of the PPP claim that sustainable development and "regional integration" is their mission. However, the PPP is the exact opposite of sustainable. Communities need to determine their own development, not governments, corporations, international financial institutions, or NGOs that think they have the solution.

Patent Regulations and the WTO

The World Trade Organization (WTO), spawned out of the General Agreement on Tariffs and Trade (GATT), is barely eight years old, but it has become one of the most powerful entities in the world. As of April 2003, 146 countries were member nations of the WTO. Over 20 international agreements comprise the WTO, several of which apply to genetically engineered organisms. The Agreement on Trade Related Aspects of Intellectual Property (TRIPS) is the global mechanism for regulating patents on GMOs, and is modeled after United States patent law. It protects intellectual property rights in the forms of trademarks, copyrights, and patents.

Under TRIPS, countries are allowed to patent life forms, including plant and animal genes and cells that have been genetically modified. Plants and animals are patentable if they are cloned or genetically altered. Under WTO rules, indigenous plants and knowledge can be patented, which gives the patent- holding company exclusive ownership and marketing rights.

When corporations 'steal' genetic material (biopiracy) and patent seeds, farmers must pay an annual fee, even if they have cultivated the same seed for years. As of 1999, ninety-seven percent of all patents worldwide were given to corporations and individuals residing in the industrialized world.[147]

The WTO Agreement on Sanitary and Phytosanitary Measures (SPS) requires nations regulating GMOs to provide scientific evidence proving that GMOs present a threat to health and the environment.[148] Ironically, the reason that many governments have begun to regulate GMOs is because no scientific data exists that guarantees GMOs are safe. This agreement places the burden of proof on the health departments of an importing country, not on the corporations that are manufacturing the potentially hazardous technology.

The US has been threatening for years to challenge the European Union under the WTO for their restrictions on the importation and cultivation of GE crops. On May 13, 2003 the US filed a lawsuit against the European Union under the WTO dispute settlement body, demanding they lift their moratorium on GE products. The US postponed taking action under the WTO while it was trying to garner support for their bombing campaign of Iraq. The US brought this lawsuit up with the backing of 9 countries: Australia, Chile, El Salvador, Honduras, Mexico, Colombia, New Zealand, Peru and Uruguay—most of these countries already have a trade agreement or are in the

process of negotiating a trade agreement with the US.

International Food Aid or Expanding US Markets?

In addition to free trade policies, the US exploits international food aid systems to dump its genetically engineered foods onto the world. International food aid facilitated either through USAID or the UN World Food Program has several economic and environmental consequences. Dumping highly subsidized basic grains can disrupt local markets and undermine the economic integrity of farmers who produce grains domestically. Many countries that face severe hunger have no alternative but to accept food aid in emergency situations. However this "aid" can come with many strings attached (similar to the structural adjustment programs of the World Bank and IMF). Food aid provides market access for US products, which are often genetically modified, in the guise of fighting hunger. Food aid often acts as a disincentive for farmers to cultivate their fields, building a stronger dependence on imports and serving as a foot in the door for US corporations to sell basic grains.[149]

Approximately 30% of the 500,000 tons of corn that USAID exports is genetically modified.[150] Zimbabwe and Zambia have taken stances against genetically engineered food aid originating from the United States. In Zimbabwe the government is demanding that any GE food aid be milled into flour, so that whole grains do not make it into the ground, preventing the threat of cross-pollination with local varieties of corn. Zambia outright denies the entrance of any food aid (milled or not) that contains GMOs. In Latin America, genetically engineered food aid has been detected in Nicaragua, Guatemala, Ecuador, Colombia, and Bolivia. Some test results of GE content were as high as 90%.[151] StarLink corn, which is approved only for cattle feed, showed up in food aid sent to Bolivia. More testing must be conducted to find out where other contamination exists.

USAID plans to give US $37.9 million in technical assistance and cooperation to help Central America negotiate CAFTA.[152] In the waiting room at the office of USAID in Managua, Nicaragua there are government pamphlets prominently placed promoting CAFTA in both English and Spanish. These pamphlets claim that CAFTA will bring economic development and prosperity to Central America. USAID is playing critical role in expanding US economic control over Central America.

The Case of El Salvador and Nicaragua

In Nicaragua, as in Mexico, *criollo* (local, indigenous variety) seed is the pride of the *campesinos*. The vast majority of farmers use indigenous varieties of corn that have been developed over centuries. If farmers cultivate both *criollo* and hybrid corn, they will consume the *criollo* first and sell the hybrid corn because they know how much better quality *criollo* is in flavor and nutritional value. In 2001, Nicaragua imported US $23 million worth of yellow corn from the US. This was an enormous increase from the previous three-year average of US $2.9 million.[153]

In El Salvador not enough corn is grown, so imports come from the US. Between October 2000 and September 2001, El Salvador imported 469,000 metric tons of corn.[154] It has become cheaper for Salvadorians to buy corn and tortillas than to cultivate the corn and make their own tortillas (*See Corporations and Corn Dumping, page 22).* In El Salvador not much indigenous seed is sown but many projects exist to recuperate the *criollo* varieties. The dependence on hybrid seeds in El Salvador (almost exclusively sold by Alfredo Cristiani, the former president and richest man in El Salvador) raises the cost of production for farmers. According to CORDES (Association for Cooperation and Communal Development for El Salvador), growing hybrid corn

is much more expensive because the farmer must buy the seed and then fertilizers and other inputs that the seed needs to grow.

In both Nicaragua and El Salvador, the governments have programs called *Libra por Libra* (Pound for Pound) that mirror Mexico's *Kilo por Kilo* (Kilo for Kilo). These so-called seed projects ask *campesinos* to give one pound or kilo of their *criollo* seed in exchange for one pound or kilo of hybrid seed. The farmers have no idea if the seed distributed by the governments is transgenic or not, but people are suspicious of the corn. Also no one knows what the governments are doing with the indigenous corn. They could be trying to isolate genes for genetic engineering, the patenting of genetic material, or using the seeds to make more hybrids.[155]

CENTA, the National Center for Forest and Agricultural Technology, was formerly a government run program in El Salvador but has been privatized. CENTA has already experimented with GE tomatoes and GE cottonseed. Cotton is open pollinated and can transfer its pollen up to five kilometers.[156] CENTA has collected *criollo* seed in El Salvador for *Libra por Libra*.

In Nicaragua a short-lived project of USAID, called PROMESA, donated five different varieties of corn to a farmer, some of which originated from Monsanto. PROMESA asked him to cultivate the varieties with special instructions about spacing and cultivating techniques. This farmer was supposed to report to PROMESA about the results with each variety. The corn needed specific fertilizer or it would not grow. PROMESA had come to the community with glossy flyers and gave a presentation about the wonders of these corn varieties, trying to get the *campesinos* to experiment with the corn. The farmer later found out that there was a possibility that the corn could have been genetically engineered. He decided to destroy the entire corn crop before it went to seed.[157] After Centro Humboldt, an environmental organization, went public saying that the corn may be transgenic, PROMESA pulled out of the area and ended its project early. The corn samples that came from PROMESA were sent for testing but the tester could not confirm whether the corn was transgenic or not.[158]

The legality of the cultivation of GE crops in Nicaragua is ambiguous. As in Mexico, the Nicaraguan Ministry of Agriculture promotes GMOs, while the Ministry of Environment rejects transgenics. In El Salvador, Article 30 of *La Ley de la Semilla* (the Law of the Seed) prohibits the production, importation, research, and marketing of GE seeds. Unfortunately this part of the law is not enforced and the rest of it favors corporate seeds over indigenous or local seed varieties.[159] The law requires that any seeds sold on the market are to be first certified by the state, a process that is much easier for corporate owners, like Alfredo Cristiani, than it is for *campesinos*. Cristiani controls almost the entire certified seed production in El Salvador. Article 30 of *La Ley de la Semilla* is a secondary law and therefore can be repealed by the president at any time.[160] The current president, Francisco Flores, is in Cristiani's ARENA party, the ruling right-wing party in El Salvador. He is also the closest ally that President Bush has in Central America at this time, and one of the main promoters of CAFTA in the region.

Centro Humboldt tested corn from food aid throughout Nicaragua. One corn sample had a 3.8% contamination rate.[161] Three samples of corn and soy flour blend contained Roundup Ready corn. These samples were from international food aid packages for the programs Food for Pregnant Women, Food for Schoolchildren, and Food for Work.[162] In El Salvador the corn donated by the UN World Food Program does not come in its original bags, so it is difficult to determine the origin of the corn and whether it is transgenic or not.

People in Nicaragua and El Salvador probably eat GE food every day and are not aware of this fact. Considering that 60-70% of all processed foods in the US contain some GE ingredients, and that the US exports corn, soy and processed food products to Central America, the products in Central America must also contain GE, even though they are not labeled. The most significant source of food comes from tortillas. The largest seller of corn flour and tortillas in Central

America is Maseca, a Mexican-based company that receives much of its corn from the US. Other products that contain GE ingredients and that are consumed regularly in Central America include Corn Flakes, Nestle food products, Bimbo food products (snack foods) and Corona beer.[163]

Resisting Genetic Contamination and Free Trade Agreements

A comprehensive plan to eradicate GMO contamination throughout the world needs to be implemented immediately. *Campesinos*, after being informed about the dangers of genetic engineering, must make the ultimate decision as to what actions should occur. Many solutions have been discussed in Oaxaca to stop and reverse genetic pollution. First, the direct source must be eliminated, by banning imports of genetically altered maize from the US. This will be difficult since Mexico is subordinate in the free trade hierarchy and is not in an economic position to dictate to the US what imports it will or will not accept. However, with enough pressure from around the world on both the Mexican and US governments, the imports could be halted. Other countries must also restrict GE imports to protect their local varieties.

The most important way to prevent genetic contamination in other parts of the world is to avoid planting corn, soy, cotton, and canola seed that originates from the US, Canada, or Argentina. This could be seed that is either imported or that comes through international food aid packages, like USAID or the World Food Program. Even if aid comes from a European country, there is no guarantee that the European country did not acquire the basic grains from the United States.

There needs to be educational campaigns throughout Mexico and Central America to inform farmers about genetic engineering and its impacts. Several campaigns already exist in Mexico, El Salvador and Nicaragua. In El Salvador several organizations including CRIPDES (Association of Rural Communities for the Development of El Salvador) and CESTA (Salvadorian Center of Appropriate Technology), are sending people out to rural communities to teach farmers about the threats of genetic engineering and free trade agreements. UNES (Salvadorian Ecological Unity) and Equipo Maíz have produced several materials on genetic engineering and have circulated these to people throughout El Salvador.

Education and ending US imports are two solutions that address the direct sources of contamination. However, they do not solve the problem of cross-pollination, which will be difficult to eradicate. Testing corn is expensive and few laboratories exist in Mexico and Central America to analyze the maize. Several NGOs and grassroots organizations are trying to fund labs and *criollo* seed saving projects. Establishing seed banks in Mexico and Central America controlled by *campesinos* could serve as a secondary source of seed preservation. Cultivation in the fields should be the primary source of conserving indigenous corn, since storage in seed banks does not permit evolution to occur. However, seed banks can provide a backup copy for genetic material of corn varieties that are GE-free.

In Mexico many *campesinos* have started seed exchange programs to replace seed that is contaminated with *criollo* varieties. In El Salvador several organizations, like CORDES (Association for Cooperation and Communal Development for El Salvador), the Swiss Worker Aid and FUNPROCOP (Foundation for the Promotion of Cooperatives) have initiated seed saving projects and *criollo* recuperation programs. These organizations know that saving their indigenous varieties is the most important means to protect against GE seed entering the countryside. Hijas del Maíz, a grassroots organization focused on environmental justice and food sovereignty in Nicaragua, has helped to implement *criollo* seed saving projects throughout Nicaragua and provides low-income women with free seed.

These suggestions only address the immediate issue of the corn contamination. A long-term strategy must be discussed to prevent further contamination of crops, especially in the world's

centers of origin of biodiversity. Stopping the production of genetically modified crops throughout the world is the most crucial long-term goal to help preserve the biodiversity of all crops and environments globally. Indigenous and *campesino* farming practices in Mexico and Central America must be preserved and encouraged. Free trade and global capitalism (through institutions like the World Bank and the IMF, and free trade agreements, like NAFTA) must not be able to dictate what farmers should produce and export to meet the needs of the industrialized countries.

A critique of genetic engineering with a deeper understanding, addressing economic hegemony and free trade must occur on a global scale so that people comprehend the underlying causes of environmental disasters, including the genetic contamination of crops. The case of genetic contamination in Oaxaca should serve as a warning to farmers throughout the world to the potential contamination of their crops with DNA from genetically modified organisms. Free trade agreements like NAFTA and the WTO must be repealed and future negotiations of free trade agreements cancelled. NGOs and CSOs must stop trying to take part in the negotiation process of free trade agreements that will never bring liberation for farmers, indigenous peoples or workers.

Agriculture has existed much longer than free trade, corporations and capitalism. Farmers do not need transnational corporations to dictate which seeds to sow or what kinds of crops they should grow. Farmers do not need free trade agreements to tell them which agricultural products they should export and import. Farmers must be able to make decisions about what kinds of crops they grow and what kinds of seeds they cultivate. They are the protectors of crop biodiversity.

Endnotes

1 Kaufman, M. "The biotech corn debate grows hot in Mexico." *Washington Post.* Washington DC, US. March 25, 2002, p. A9.
2 Brown, P. "Mexico's vital gene reservoir pouted by modified maize." *The Guardian.* London, England. April 19, 2002.
3 Ferrara, J. & Dorsey, M. "Genetically engineered foods: A minefield of safety hazards." In B. Tokar (ed.). *Redesigning Life? The Worldwide Challenge to Genetic Engineering.* London: Zed Books. 2001. p. 52.
4 Equipo Maíz.'*Los Transgénicos.* San Salvador, El Salvador: Equipo Maíz, 2002, p. 22.
5 Hansen, M. "Genetic engineering is not an extension of conventional plant breeding." Consumers Union. 1998. p. 2. Available at http://www.consumersunion.org/food/widecpi200.htm
6 Ibid.
7 Steinbrecher, R. "Ecological consequences of genetic engineering." In B. Tokar (ed.). *Redesigning Life? The Worldwide Challenge to Genetic Engineering.* London: Zed Books. 2001. p. 83.
8 Crouch, M. "From Golden Rice to Terminator Technology: Agricultural biotechnology will not feed the world or save the environment." In B. Tokar (ed.). *Redesigning Life? The Worldwide Challenge to Genetic Engineering.* London: Zed Books. 2001. p. 29.
9 Steinbrecher, R. "Ecological consequences of genetic engineering." In B. Tokar (ed.). *Redesigning Life? The Worldwide Challenge to Genetic Engineering.* London: Zed Books. 2001. p. 84-86.
10 Ibid. p. 84.
11 Pollan, M. "Fried, mashed and zapped with DNA?" *The New York Times Magazine.* October 25, 1998. p. 50.
12 Tokar, B. "Biotech corn and the deaths of butterflies." *Food and Water Journal.* Summer 1999. p. 20.
13 Pollan, M. "Fried, mashed and zapped with DNA?" *The New York Times Magazine.* October 25, 1998. p. 50.
14 Lean, G. "Insects thrive on GE 'pest-killing' crops." *The Independent.* March 30, 2003. Available at http://news.independent.co.uk/uk/environment/story.jsp?story=392044
15 Ibid.
16 Steinbrecher, R. "Ecological consequences of genetic engineering." In B. Tokar (ed.). *Redesigning Life? The Worldwide Challenge to Genetic Engineering.* London: Zed Books. 2001. p. 84-85.
17 Gledhill, M. & McGrath, P. "Call for a spin doctor," *New Scientist*, November 1, 1997.
18 C. Gilbert. "Honeybees and Genetically Engineered Canola Oil." October 1997. Available at http://www.pmac.net/canola.htm
19 Steinbrecher, R. "Ecological consequences of genetic engineering." In B. Tokar (ed.). *Redesigning Life? The Worldwide Challenge to Genetic Engineering.* London: Zed Books. 2001. p. 84.
20 D. Saxena, S. Flores and G. Stotzky. "Insecticidal toxin in root exudates from Bt corn." *Nature,* 402, 1999.
21 Losey. J, Rayor, S. & Carter, M. "Transgenic pollen harms monarch larvae." *Nature,* 399 (6733) May 20, 1999. p. 214.
22 Ibid.
23 Steinbrecher, R. "Ecological consequences of genetic engineering." In B. Tokar (ed.). *Redesigning Life? The Worldwide Challenge to Genetic Engineering.* London: Zed Books. 2001. p. 85.
24 Sears, M.K. et. al., "Impact of Bt corn pollen on monarch butterfly populations: A risk assessment," Proceedings of the National

Academy of Sciences, September 2001, and subsequent articles in the same issue, Available at http://www.pnas.org/cgi/doi/10.1073/pnas.211329998 (211277798, and 211234298).

25 Block, T. "Pseudopregnancies puzzle swine producer." Iowa Farm Bureau. April 29, 2002.
26 Ibid.
27 Network of Concerned Farmers. "Farmers seek action regarding GE corn batch causing breeding problems." January 23, 2003. p. 1. Available at http://www.non-gm-farmers.com
28 Pollack, A. "Widely Used Crop Herbicide Is Losing Weed Resistance." *New York Times.* January 14, 2003. p. C2.
29 Mendelson, J. "Roundup: The world's biggest selling herbicide." *The Ecologist, 28* (5), 1998.
30 Pollack, A. "Widely Used Crop Herbicide Is Losing Weed Resistance." *New York Times.* January 14, 2003. p. C1.
31 Ibid. p. C2.
32 Ibid. p. C2.
33 MacArthur, M. "Triple-resistant canola weeds found in Alta." *Western Producer.* February 10, 2000. Retrieved April 28, 2003 from http://www.producer.com/articles/20000210/news/20000210news01.html Also Khachatouians, G., Phillips, P., & Smyth, S. "Liabilities and economic of transgenic crops." *Nature Biotechnology.* Vol. 20. June 2002. p. 538. Available: http://biotech.nature.com
34 Pollack, A. Widely Used Crop Herbicide Is Losing Weed Resistance. *New York Times.* January 14, 2003. p. C1-2.
35 Mendelson, J. Roundup: The world's biggest selling herbicide. *The Ecologist,* 28 (5), 1998. p. 272.
36 Ibid.
37 Cox, Caroline, "Glyphosate," *Journal of Pesticide Reform,* 11, (2) Summer 1991.
38 Mendelson, J. "Roundup: The world's biggest selling herbicide." *The Ecologist,* 28 (5), 1998. p. 272.
39 Ibid. p. 274.
40 Ibid. p. 272.
41 Ibid. p. 272.
42 Enciso, A. "Experts alert about the release of this corn variety into the market in the near future: Contraceptive corn, a danger: it could cause human sterility." *La Jornada.* January 25, 2002.
43 Brasher, P. "Biotech company to isolate plants." *Des Moines Register Washington Bureau.* November 16, 2002. Available at http: //www.nerage.org
44 Ibid.
45 Bohlen, L. Biopharming: "A new potential form of GMO contamination." *GMO Contamination around the World.* Amsterdam: Friends of the Earth International. 2002. p. 20. See also Brian Tokar, "Biohazards: The Next Generation? Companies Are Genetically Engineering Crop Plants that Manufacture Industrial and Pharmaceutical Proteins," Edmonds, WA.: Edmonds Institute, 2001, available at http://www.neRAGE.org/stories.php?story=02/03/20/1083111.
46 Brasher, P. "Biotech company to isolate plants." *Des Moines Register Washington Bureau*. November 16, 2002. Available at http: //www.nerage.org
47 Ibid.
48 Pollack, A. "Stricter rules for modified crops." March 7, 2003. Available at http: //www.nerage.org
49 Bohlen, L. "Biopharming: A new potential form of GMO contamination." *GMO Contamination around the World.* Amsterdam: Friends of the Earth International. 2002. p. 21.
50 Schmitz, S. "Promiscuity, pollination, and genes." *Synthesis/Regeneration: A Magazine of Green Social Thought,* 18, 1999, p. 31-33
51 Khachatouians, G., Phillips, P., & Smyth, S. "Liabilities and economic of transgenic crops." *Nature Biotechnology.* Vol. 20. June 2002. p. 537-539. Available: at http://biotech.nature.com
52 Tokar, B. "Biotech corn and the deaths of butterflies." *Food and Water Journal.* Summer 1999. p. 22.
53 Associated Press. "Researchers document cross-pollination of genetically engineered corn." *Associated Press.* February 19, 2002.
54 Center for Food Safety. "The hidden health hazards of genetically engineered foods." *The Center for Food Safety Review.* Spring 1999.
55 Ferrara, J. & Dorsey, M. "Genetically engineered Foods: A minefield of safety hazards." In B. Tokar (ed.). *Redesigning Life? The Worldwide Challenge to Genetic Engineering. London*: Zed Books. 2001. p. 57.
56 Ibid. p. 63.
57 Ibid. p. 58.
58 Ewen, S. & Pusztai. " Effect of diets containing genetically modified potatoes expressing *Galanthus nivalis* lectin on rat small intestine." *Lancet*, Vol. 354, No. 9187. October 16, 1999. p. 1353-4.
59 Ferrara, J. & Dorsey, M. "Genetically engineered foods: A minefield of safety hazards." In B. Tokar (ed.). *Redesigning Life? The Worldwide Challenge to Genetic Engineering.* London: Zed Books. 2001. p. 58.
60 Ruiz-Marrero, C. "Genetic pollution: Biotech corn invades Mexico." *CorpWatch.* March 20, 2002. Available at http: //www.corpwatch.org/issues
61 Friends of the Earth. *GMO Contamination around the World.* Amsterdam: Friends of the Earth International. 2002. p. 12
62 Ibid. p . 10.
63 Ross, J. "Tinkering with the tortilla: Genetic engineering threatens Mexico's corn culture." *Sierra Magazine,* 86 (5), September/October 2001. p. 21.
64 Ruiz-Marrero, C. "Genetic pollution: Biotech corn invades Mexico." *CorpWatch.* March 20, 2002. Available at http: //www.corpwatch.org/issues
65 Shadid, A. "Tests for genetic corn spur concerns amounts of disputed variety found in 10% of US grain inspections." *Boston Globe.* May 3, 2001.
66 Friends of the Earth. *GMO Contamination around the World.* Amsterdam: Friends of the Earth International. 2002. p. 11.
67 Ibid.
68 Ibid. p. 13.

69 Ibid. p. 14.
70 Ibid. p. 14.
71 Ibid. p. 19.
72 Percy Schmeiser, Canadian Canola Farmer. Lecture. Burlington, Vermont. February 19, 2003.
73 Shinkle, P. "Monsanto reaps some anger with hard line on reusing seeds." *St. Louis Post-Dispatch.* May 12, 2003. p. A1.
74 Ibid. p. A7.
75 John Cleary, Northeast Organic Farming Association. Personal communication. Richmond, Vermont. March 15, 2003.
76 Wallach, L. "Fast Track Import Sensitive Agriculture Chart." Letter to the Continental Coordination of Campaign against the FTAA. Washington DC: Public Citizen. January 15, 2003. Available at http://www.citizen.org/print_article.cfm?ID=8854
77 Ibid.
78 Naiman, B. & Wallach, L. "NAFTA: Four and a half years later." *The Ecologist*. Vol. 28. No. 3. p. 171-176.
79 Public Citizen. *School of Real-Life: Report Card.* Public Citizens' Global Trade Watch, Washington DC, 1998. Available at www.citizen.org
80 Anderson, S. *Seven Years Under NAFTA*. Washington DC, Institute for Policy Studies. January 2001.
81 Public Citizen. *School of Real-Life: Report Card,* Public Citizens' Global Trade Watch, Washington DC, 1998. Available at www.citizen.org
82 Public Citizen. *Deals for NAFTA Votes II: Bait and Switch.* Washington DC: Public Citizen's Global Trade Watch. 1999. Available at www.citizen.org
83 Ibid.
84 González, R. *Zapotec Science: Farming and Food in the Northern Sierra of Oaxaca.* Austin: University of Texas Press. 2001. p. 120.
85 Boyce, J. "The environment and security: The maize connection." *Political Environments.* (5), September 30, 1997. p. 22.
86 Chapela, I. & Quist, D. (2001 November). "Transgenic DNA introgressed into traditional maize landraces in Oaxaca, Mexico." *Nature* 414, p. 541-543.
87 Brown, P. "Mexico's vital gene reservoir pouted by modified maize." *The Guardian.* April 19, 2002.
88 Ibid.
89 Magallón, Héctor. Greenpeace Mexico. Interview February 21, 2002.
90 Kaufman, M. "The biotech corn debate grows hot in Mexico." *Washington Post.* March 25, 2002. p. A9.
91 Raghavan, C. "Mexico: NAFTA corn liberalization fails farmers, environment." *Third World Network* : Geneva. October 2002. Available at http://www.twnside.org.sg/title/Mexico.htm
92 Nadal, A. *The Environmental and Social Impacts of Economic Liberalization on Corn Production in Mexico.* (El Colegio de México). 2002. Oxford: Oxfam and World Wildlife Fund.
93 Gzesh, S. & Seymour, A. (2000, October). Greenpeace and Mexico-based ANEC launch new project to end the importation of U.S. genetically engineered corn. *Mexico- U.S. Advocates Network,* 2 (8).
94 El Campo No Aguanta Más. Flyer from farmer protest in Mexico City. January 31, 2003.
95 Rosenberg, T. Editorial: "Why Mexico's small farmers go hungry." *New York Times*. March 3, 2003.
96 Nadal, A. *The Environmental and Social Impacts of Economic liberalization on Corn Production in Mexico.* (El Colegio de México). Oxford: Oxfam and World Wildlife Fund. 2002. p. 27.
97 Associated Press. "Mexico signs pact to update farming industry." *The News-Press*. Cape Coral, Florida. April 29, 2003, A2.
98 Ana Ruiz Diaz, Permaculture Network of Mexico. Talk at Biodevastation 7 in St. Louis, Missouri. May 17, 2003. Available at http://www.biodev.org/archives/000101.php.
99 Stevenson, M. "Mexicans angered by spread of corn." *Associated Press.* December 29, 2001.
100Brasher, P. "Biotech crops spread in the US." *Burlington Free Press.* March 29, 2002. p. A1.
101 Kaufman, M. "The biotech corn debate grows hot in Mexico." *Washington Post.* March 25, 2002. p. A9.
102 Manuel Mérida, Unit Boss at Diconsa headquarters in Oaxaca City. Interview January 6, 2002 in Oaxaca City, Oaxaca, Mexico.
103 Conabio & INE (Two agencies of Mexican government). Report presented at the In the Defense of Corn Conference in Mexico City January 2002.
104 Interview January 12, 2002 in Ixtlán, Oaxaca, Mexico.
105 Interview January 11, 2002 in Guelatoa, Oaxaca, Mexico.
106 DeSantis, S. Survey for thesis for the University of Vermont. 29 *Campesino* families from five communities. Interviews from January 4, 2002 to January 13, 2002 in Ixtlán, Guelatoa, Calpulalpan, Yavesia, and San Juan (in the Sierra Juárez of Oaxaca, Mexico).
107 Alejandro Ruiz, agronomist. Interview January 11, 2002 in Guelatoa, Oaxaca, Mexico. And Ignacio Chapela, professor of Environmental Science, Policy and Management at the University of California at Berkeley. Interview via phone January 28, 2002.
108 DeSantis, S. Survey for thesis for the University of Vermont. 29 *Campesino* families from five communities. Interviews from January 4, 2002 to January 13, 2002 in Ixtlán, Guelatoa, Calpulalpan, Yavesia, and San Juan (in the Sierra Juárez of Oaxaca, Mexico).
109 Aurelio Bautista, technician for SAGARPA. Interview January 13, 2002 in Calpulalpan, Oaxaca, Mexico.
110 Ibid.
111 Rosenberg, T. Editorial: "Why Mexico's small farmers go hungry." *New York Times*. March 3, 2003.
112 Umberto Rosales, engineer with SAGARPA, Interview January 6, 2002 in Oaxaca City, Oaxaca, Mexico.
113 El Campo No Aguanta Más. Flyer from farmer protest in Mexico City. January 31, 2003.
114 Ibid.
115 Ramos, K. "Telecomunicaciones y tema laboral claves en TLC." *La Prensa Grafica.* San Salvador. February 27, 2003. p. 38.
116 Alliance for Responsible Trade. "Joint Declaration on the Proposed US-Chile Free Trade Agreement." Available at www.genderandtrade.net/NorthAmerica/North_America.htm April 11, 2003. p. 2.

117 Watkins, N. & Weisbrot, M. *Recent Experiences with International Financial Market: Lessons for the FTAA* Washington DC: Preamble Center. 1999. p. 9.
118 Ramos, K. "Prometen buscar mecanismos que no afectan a los centroamericanos." *La Prensa Grafica.* San Salvador. April 3, 2003.
119 Trigueros, G. "La propuesta sólo contiene peticiones. Solicita acceso para 70% de sus productos." *El Diario de Hoy.* San Salvador. April 4, 2003.
120 Ibid.
121 "Nicaragua seeks protections for some industries in CAFTA." April 18, 2003.
122 Ramos, K. "Medicamentos dan dolor de cabeza a negociadores TLC." *La Prensa Grafica.* San Salvador. February 28, 2003. p. 42.
123 El Diario de Hoy. "Apoyo de AID a negociacíon con Estados Unidos." *El Diario de Hoy.* February 11, 2003. p. 39.
124 Quoted in Friends of the Earth, *GMO Contamination around the World,* August 2002. p. 19. From *The Guardian,* January 21, 2001.
125 Ross, J. "In Mexico, the struggle grows for basics: Hunger for beans, tortillas provokes protests, food raids." *National Catholic Reporter, 32* (42), October 4, 1996.
126 GRUMA. Available at *www.GRUMA.com*
127 Ibid.
128 Ross, J. "Tortilla Wars." *The Progressive* 63 (6), June 1999.
129 Maseca. Available at www.gimsa.com
130 Public Citizen. *Down on the Farm: NAFTA's seven years war on farmers and ranchers in the US, Canada and Mexico.* 2001. Available at www.citizen.org/trade/nafta/agriculture
131 GRUMA. Available at www.GRUMA.com
132 Ross, J. "Tortilla Wars." *The Progressive* 63 (6), June 1999.
133 Ross, J. "In Mexico, the struggle grows for basics: Hunger for beans, tortillas provokes protests, food raids." *National Catholic Reporter*, 32 (42), October 4, 1996.
134 Nadal, A. *The Environmental and Social Impacts of Economic Liberalization on Corn Production in Mexico.* (El Colegio de México). Oxford: Oxfam and World Wildlife Fund. 2002. p. 39.
135 Ross, J. "Tortilla Wars." *The Progressive* 63 (6), June 1999.
136 Ibid.
137 Cummins, R. "Frankencorn threatens Mexico's ancient maize." *Biodemocracy News.* May 16, 2002. p. 2. Available at http://www.alternet.org
138 Nadal, A. *The Environmental and Social Impacts of Economic Liberalization on Corn Production in Mexico.* (El Colegio de México). Oxford: Oxfam and World Wildlife Fund. 2002. p. 38.
139 Cummins, R. "Frankencorn threatens Mexico's ancient maize." *Biodemocracy News.* May 16, 2002. p. 2. Available at http://www.alternet.org
140 Rudiño, L. "Aumenta la dependencia mexicana en granos: USDA." *El Financiero.* Mexico City. March 17, 2003. p. 18.
141 Ag Journal. "About-face for ADM," *Ag Journal.* February 2, 2000. Available at www.agjournal.com/story.cfm?story_id=673
142 Greenpeace. "Greenpeace Mexico battles genetically engineered corn." 2001. Available at http://act.greenpeace.org
143 Warpehoski, C. "Introduction to the Plan Puebla Panama." *Plan Puebla Panama: Battle over the Future of Southern Mexico and Central America.* Network Opposed to the Plan Puebla Panama. 2002. p. 5-7. Available at http://www.asej.org
144 La Coordinadora Regional de Los Altos de Chiapas. Maquiladoras: "The march of sweatshops toward the south." *Plan Puebla Panama: Battle over the Future of Southern Mexico and Central America.* Network Opposed to the Plan Puebla Panama. 2002. p. 19. Available at http://www.asej.org
145 Personal communication, February 4, 2003.
146 Personal communication, February 27, 2003.
147 Wallach, L. & Sforza, M. *Whose Trade Organization?* Washington, DC: Public Citizen. (1999). p. 104.
148 Ibid. p. 88.
149 Pasternak, S. "War by other means: Geopolitics and Pop-Tarts in the new agrarian order." *Food Not Lawns, Volume II*. 2002. p. 15.
150 Ibid. p. 16.
151 Friends of the Earth. *GMO Contamination around the World.* Amsterdam: Friends of the Earth. 2002. p. 17.
152 El Diario de Hoy. "Apoyo de AID a negociacíon con Estados Unidos." *El Diario de Hoy.* Guatemala City. February 11, 2003. p. 39.
153 US Embassy in Nicaragua. *Chapter V: leading Sectors for US Exports and Investment*. Available at http://usembassy.state.gov/managua/wwwhe12.html.
154 USDA. "World Corn Trade." Available at http://www.fas.usda.gov/psd/complete_tables/GF-table788.htm
155 Julio Sanchez, Centro Humboldt. Interview February 13, 2003.
156 Menjivar, G. & Sermeño, J. "Agricultura ayer- agricultura hoy: A donde nos lleva la biotecnología." *Ecologia Salvadoreña.* San Salvador: Unidad Ecologica Salvadoreña. September 1999. p. 23.
157 Interview with campesino in Nicaragua. February 20, 2003.
158 Julio Sanchez, Centro Humboldt. Interview February 13, 2003.
159 Edith Campos and Euracio Segura Mauricio, CESTA (Salvadorian Center for Appropriate Technology), Interview February 7, 2003 in San Salvador.
160 Ibid.
161 Friends of the Earth. *GMO Contamination around the World.* Amsterdam: Friends of the Earth. (2002). p. 19.
162 Ibid.
163 Equipo Maíz. *Los Transgénicos.* San Salvador: Equipo Maíz. (2002). p. 66-69.

Genetically-Engineered Trees

By Brad Hash, Action for Social and Ecological Justice

Currently, trees are being genetically engineered to express a variety of traits solely to increase their productivity for the corporations holding their patents. There are four main traits being engineered into trees: herbicide tolerance (Monsanto's Roundup); insecticide producing, specifically *Bacillus thuringiensis* (Bt) bacterial toxin, in every cell of the tree; reduced lignin for economical processing of wood fiber to pulp and paper fiber; and sterility to attempt to limit contamination of wild relatives. Other traits being researched are tolerance to drought, frost, disease and salt.

Three key factors – age, size, and propagation – separate transgenic trees from transgenic crops. Most agricultural crops exist from seed to harvest for roughly six months, whereas trees can live for hundreds of years. Even in the case of plantation forestry, most trees survive 30-70 years before felling. As well, after only a couple years plantation trees surpass crops in size and mass, quickly dwarfing them well before harvest age. Both of these characteristics will severely exacerbate the perilous ecological effects of Bt-toxin expression. The Bt-toxin exudes from organisms of this size and age will be unparallelled and its subsequent impacts on soil and water systems will be catastrophic. Propagation of GE trees differs from crops because trees have the ability to spread pollen up to 700-800 kilometers potentially affecting 150,000 sq. km.

There are at least 20 countries with field trials and over 140 field trials of GE trees in the US alone. Much of the international interest in the research and development of GE trees is concentrated in nations of the Global South, such as Chile and Mexico, where plantation forestry is steamrolling over the landscape. While at least 24 tree species are being engineered, the focus is on 3 major plantation species: Eucalyptus, Radiata (Monterey) Pine, and Poplar.

Who's in Control of Our Genes?

- In 2001, four countries controlled 99% of the genetically engineered crop production: United States 68%, Argentina 22%, Canada 6%, and China 3%.[1]
- Monsanto, Syngenta, Dupont, and Bayer (owner of the former Aventis Crop Science) control 80% of the agricultural biotechnology, 23% of seeds and 100% of transgenic seeds globally.[2] These corporations also provide pesticides and other inputs needed for a monocultural-style of agriculture.
- In 2002, the United States produced over 9 billion bushels of corn, 42% of the world's supply.[3]
- Monsanto estimated their 2002 revenues at $4.6 billion.[4]

Percentage of United States' Crops that are Genetically Engineered

	2000[5]	2001[6]	2002[7]	2003[8]
Corn	25	26	34	38
Soy	54	68	75	80
Cotton	N/A	69	71	70

[1] Friends of the Earth. *GMO Contamination around the World.* Amsterdam: Friends of the Earth International. 2002. p. 8.
[2] Equipo Maíz. *Los Transgénicos.* San Salvador, El Salvador: Equipo Maíz. 2002. p. 36.
[3] Guterl, F. "The Fear of Food". *Newsweek.* January 27, 2003.
[4] Pollack, A. "Widely Used Crop Herbicide Is Losing Weed Resistance." *New York Times.* January 14, 2003. p. C2.
[5] Brasher, P. "Biotech Crops Spread in the US." *Burlington Free Press.* March 29, 2002. p. A1.
[6] Ibid.
[7] Pollack, A. "Survey Predicts More Planting." *New York Times*. April 1, 2003.
[8] Ibid. Estimated.

Bilateral Trade and Investment Agreements: Stealth Neoliberal Globalization

By Aziz Choudry, GATT Watchdog

Since the demise of the Multilateral Agreement on Investment (MAI) – an OECD investment agreement that included measures similar to NAFTA's Chapter 11 – and the failure of the Seattle WTO Ministerial to launch a new round of global trade talks, there has been a proliferation of negotiations on bilateral trade and/or investment agreements. Some free-marketeers worry that these bilateral/regional agreements may undermine the WTO and create a "spaghetti bowl effect" of overlapping and contradictory rules.[1] WTO rules say that the purpose of bilateral or regional agreements should be to facilitate trade between the constituent countries and not to raise barriers to trade of other WTO members, which are not parties to the agreement. But we should see them as stepping stones towards full integration into the "global free market economy."

In other words, bilateral trade agreements are another way to ensure that governments implement the liberalization, privatization and deregulation measures of the corporate capitalist agenda. Many governments see them as circuit breakers towards faster and deeper liberalization because of what they see as slow progress in WTO negotiations. They say that they are catalysts towards wider regional trade agreements and add momentum to global free trade and investment. For example, the intellectual property provisions in the recently negotiated US-Chile bilateral go even further than the WTO Trade-Related aspects of Intellectual Property Rights agreement (TRIPS), drawing criticism from public interest and health groups for restricting access to affordable lifesaving drugs.[2] Such expansive commitments in bilateral agreements can set dangerous precedents, which can be used as leverage in other trade and investment agreements. The US also views bilateral agreements and CAFTA as ways to add impetus to FTAA negotiations, which have drawn growing opposition throughout the region.

Remember Chapter 11, NAFTA's powerful investment chapter that provides corporations with the right to sue governments for enacting any public policy or law that they do not like? Many bilateral free trade and/or investment agreements contain similar provisions. Even before such a powerful tool can be expanded and applied to 34 countries under the FTAA, other countries in the Americas are being sued under bilateral investment agreements. For example, transnational water giant Bechtel is suing Bolivia under a 1992 bilateral investment treaty for loss of profits after the reversal of the Cochabamba water privatization following a popular uprising.[3] "It seems the high-profile disputes under the NAFTA appear to have inspired many litigators to dust off NAFTA's more obscure predecessors," writes Luke Peterson,[4] commenting on the recent upsurge in investor-to-state disputes arising from bilateral agreements being dealt with by the World Bank's private arbitration body for investment disputes, the International Center for Settlement of Investment Disputes.

There is a geopolitical dimension to all of this, too. The Bush administration is "rewarding" countries like Morocco and Australia for their support in the "War on Terror" by negotiating bilateral free trade and investment agreements. In the words of US Trade Representative (and former Enron consultant) Robert Zoellick: "Just as modern business markets rely on the integration of networks, we need a web of mutually reinforcing regional and bilateral trade agreements to meet diverse commercial, economic, developmental and political challenges."[5]

There has been relatively less recent international mobilization/protest and networking focusing on the use of bilateral agreements to advance trade and investment liberalization, economic reforms and the neoliberal agenda. Lower-key bilateral/regional negotiations have the

advantage of attracting less publicity and attention conducive to creating international mobilizations opposing deals like the WTO or FTAA. Meanwhile the governments of smaller, poorer countries struggle to find the resources necessary to negotiate several deals at once. Unless we expose and oppose these deals much of what we oppose about the WTO and the FTAA will be delivered by the backdoor, bit by bit.[6]

1 Jagdish Bhagwati, cited in Peter Passell, Economic Analysis: Doubts Grow About Regional Trade Pacts, Peter Passell, New York Times, 02/04/97)

2 The United States-Chile Free Trade Agreement: A Threat To Public Health and Access To Medicines, sign-on letter to USTR Robert Zoellick, 12/04/02 at www.woaafrica.org/AIDS47.htm

3 See Bechtel Vs Bolivia, Pacific News Service 12/19/01 and www.democracyctr.org/bechtel/bechtellegalaction.htm

4 Changing Investment Litigation, Bit by Bit, Bridges, May 2001

5 US Trade Representative, Overview and the 2003 agenda, p. 9, www.ustr.gov

6 See Aziz Choudry, Bombarded by Bilateral Trade and Investment Agreements at www.tieasia.org/ReportsNEW.htm; and We Must Mobilise Against A Miasma of Mini-MAIs, ZNet Commentary, 06/21/01 at—http://www.zmag.org/sustainers/content/2001-06/21choudry.htm

Indigenous Chiapans Challenge Biopiracy and GMOs

Brian Tokar, ISE Biotechnology Project

A recent delegation to the rainforest of southeastern Mexico discovered that issues of biopiracy and GMOs are very much on the minds of *campesinos*, activists and traditional healers in the highlands of Chiapas and beyond. The delegation investigated the environmental and human rights situation in the Montes Azules Biosphere Reserve, which was established in 1978, granting U.N. protection to the rainforest that covers much of the eastern half of the Mexican state of Chiapas. The reserve's vast rainforests contain thousands of plant species and a quarter of all the animal species that are found anywhere in Mexico, making it a prime focus for companies with interests in bioprospecting (biopiracy) of the earth's biological diversity.

At the same time, this phenomenal biodiversity has been embraced by the current Mexican government as a rationale for expelling Zapatista base communities and other indigenous settlements inside the Reserve. At least 32 indigenous communities are now threatened with dislocation; several have been raided by armed federal officers. While it is clear that these communities are far more skilled in living sustainably on the land than those who would displace them, the Mexican government proclaims a concern for the health of the rainforest as a rationale for expelling forest dwellers. Conservation International is one environmental NGO that has publicly intervened on the side of the government, helping provide political cover for the increasing militarization of the entire region.

The Council of Organizations of Traditional Healers and Midwives of Chiapas, known by its Spanish acronym COMPITCH, was formed in 1994 to offer a united indigenous voice for more appropriate uses of the forest. In 2000-01, the traditional healers of COMPITCH confronted a US-government funded program to catalog the native plants of the region and their traditional uses, and ultimately forced its cancellation. The project was a collaboration of researchers at the University of Georgia and a Welsh biotechnology company called Molecular Nature Ltd., and it was supported by Mexico's state environmental research agency (ECOSUR) with funds from the US National Institutes of Health.

The Rural Advancement Foundation International (RAFI, now the "ETC Group") reported in November of 2000, "One of the great bones of contention has been the Mayan's objections to the institutions' heavy-handed method of obtaining the necessary...consent from Chiapas communities." The project's consent forms gave the researchers exclusive rights to any commercial products resulting from their investigations. Several months later, the Mexican government's support for the project was withdrawn under intense international pressure, and ECOSUR "definitively cancelled" the project in November of 2001.

Following this turn of events, larger biotech companies like Monsanto and Novartis appear to have suspended their own involvements in southern Mexico, according to Ana Valadéz of COMPITCH, seeking parts of the world where biopiracy can proceed with far less public scrutiny and opposition. But Conservation International, which supports the government's program of expelling indigenous people from the rainforest, has established several biological research stations in Chiapas in collaboration with Grupo Pulsar, a Mexican-based transnational that has close ties to the innermost circles of the current Mexican administration. Pulsar's seed division, Seminis, is the largest seller of vegetable seeds in the Western Hemisphere and has an active business collaboration with Monsanto. Conservation International has its own interests in bioprospecting, and counts most of the world's leading oil and agrochemical companies among its corporate patrons. Last year, Conservation International collaborated with USAID in developing

detailed aerial maps of indigenous "invasions" into the rainforest, which have been used by the government's environmental prosecutor's office to justify the planned expulsions.

Many indigenous representatives have an intimate understanding of the complex interconnections between the government's increased threats against indigenous communities and the wider problems of oil and hydroelectric development, bioprospecting, and the contamination of indigenous corn varieties by imported GMOs. They are all part of a long-standing effort by the government to strengthen its control over resource-rich areas of Chiapas, most recently embodied by the proposed Plan Puebla Panama (PPP), which would turn much of southern Mexico, all the way through Central America, into one vast free trade zone, specializing in transoceanic transport and export processing. The Mayan people of the region are organizing in opposition to this plan, which could represent a final blow to the phenomenal biological and cultural diversity of the region.

"We don't want them to privatize our rivers, plants and animals," explained a representative of the indigenous Mayan settlement of Nueva Israel to the delegation that visited the Montes Azules this past March. "We don't want our plants and seeds to be genetically modified. We don't recognize in any way the PPP. We indigenous communities will fight the PPP whatever the consequences. We are not chickens waiting in cages to be fed their genetically modified corn."

For more information on the PPP and the growing hemisphere-wide opposition, see www.asej.org. For regular updates on the situation in the Montes Azules, see chiapas.indymedia.org.