

CROPS UNDER QUESTION

A briefing book on genetically
engineered Bt crops

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Introduction

In 1995, Environmental Protection Agency (EPA) granted a time-limited registration for commercial planting of a class of genetically engineered plants, known as Bt crops. Since 1995 Bt crops have taken over a significant portion of agriculture in the United States including almost 20% of corn and over 35% of cotton. This has occurred despite a critical lack of study and data on how such crops might impact, public health, the environment, and even American farms.

EPA bears the primary responsibility for ensuring the safety of pesticides used in the U.S., including such novel innovations as Bt plants, in which the plant itself produces its own toxic pesticide—known as Bt—thanks to a gene spliced into the plant's genome from a bacterium.

After six years of use, serious scientific and economic issues have come to light on the effects Bt crops could be having, including the possibilities that:

- U.S. farmers could suffer enormous losses due to being shut out of European and Asian markets, where such genetically engineered foods are not allowed;
- Bt plant pesticides will trigger allergic reactions in those who consume the novel proteins;
- Significant numbers of non-target insects, such as the Monarch and endangered Blue Karner butterflies, may be harmed by widespread use of Bt plants;
- Intrinsically haphazard methods of splicing foreign genetic material could create unintended consequences, such as altering a plant's nutrition or toxicity;
- Pests will develop resistance to Bt from such continuous exposure, with the consequent loss of an important organic pesticide alternative;
- Bt produced by genetically engineered plants might accumulate in the soil, unlike organic Bt sprays.

Now Bt crops are up for re-registration. EPA has been soliciting public comment during a 45-day period—due to end August 31—and will make its decision on whether to renew the crops registration or cancel them by September 30, 2001.

This booklet describes the issues surrounding the registration of Bt plants, along with some of the environmental and public health concerns associated with such crops.

Background

Genetically engineered plants

Plant genetic engineering is the process of inserting foreign genes into the chromosomes of a host plant's cells, to develop traits that do not naturally occur in the plant. The insertion of foreign genetic material into the host genome is essentially random since scientists don't know if or where the foreign gene will be spliced into the plant's DNA, or how many copies of the gene will be inserted. The insertions are done in one of three ways; fired into cells on tiny pellets, using a bacteria or through electrical or chemical treatments. Scientists insert a "promoter," together with the foreign genetic material to "turn on" the foreign genes. This process overrides the plant's natural ability to eradicate the foreign genetic material and forces the desired traits to appear.

Genetic engineering is not the same as traditional plant breeding. Traditional breeding cannot transfer genes across species barriers. Genetic engineering allows genes to be crossed between any two life forms, such as a chicken and an apple, or bacteria and corn.

Bt plants

Bt is a type of toxin derived from a soil bacterium, *Bacillus thuringiensis* (Bt). Bt spray is a natural pest-control product that is relatively safe and effective against many serious agricultural pests. For more than 50 years, conventional and organic farmers have used Bt in spray form to control insect pests. Toxins in Bt sprays break down rapidly in the environment and do not persist in water or accumulate in the food chain.

Pesticide Bt plants are crops that have been genetically engineered to produce the toxic protein of *Bacillus thuringiensis*. To develop Bt crops, a company isolates the pesticidal gene from Bt, and then genetically engineers it into the plant. The plant then produces its own Bt toxin in all or most of its tissues throughout the growing season. When certain moths, butterflies, and beetles eat the plant tissue containing the genetically engineered Bt toxin, the substance disrupts their digestive systems and kills them.

This year genetically engineered Bt plants are planted on 14 million acres, or 19% of corn, and 6 million acres, or 37% of cotton, grown in the United States.¹ Other Bt-producing crops that have been field tested in the U.S. but are not yet commercialized include canola, rice, soy, tomatoes and walnuts. Bt potatoes are approved by the U.S. government, but Monsanto, the company that developed the crop, has withdrawn them from the market.

Bt Corn

Bt corn was first approved by EPA in 1995. Bt corn includes field corn used primarily as animal feed, sweet corn and popcorn varieties grown for human consumption. Bt corn was developed to kill the caterpillar of the European corn borer moth by expressing the Bt toxin in the leaves, stalk and kernels of the plant.

In May 1999, Bt corn first made headlines when Cornell University laboratory tests found that monarch butterfly caterpillars died after eating milkweed leaves dusted with pollen from Bt corn. Then Frito-Lay Co. announced in January of 2000, that it would stop buying GE corn in response to consumer concerns. (Frito-Lay bought more than 1.2 billion pounds of corn in 1999.)

Most recently, StarLink™, a variety of Bt corn that is not approved for human consumption, was found in the human food supply through testing commissioned by the GE Food Alert coalition in September 2000. As a result, EPA forced Aventis CropScience, the corn's developer, to withdraw its license for StarLink, and recalls were issued for tens of millions of consumer food products (e.g., boxes of taco shells) tainted with StarLink. After a year-long government investigation, leading allergy experts have concluded that even billionths of a gram of StarLink in food products cannot be considered safe.

Bt Cotton

Bt cotton was grown commercially for the first time in 1996. It is engineered to control the tobacco budworm, cotton bollworm, and pink bollworm.

Bt Crops Registration

EPA oversees pesticides; both chemical pesticides and those produced by plants. Bt plants are regulated as “plant pesticides.” EPA determines the risk plant-pesticides pose to both people and the environment including the maximum allowable levels of pesticide residues in or on foods – known as “food tolerances.” The agency may grant an exemption from the food tolerance requirement if it finds that there is a “reasonable certainty” that aggregate exposures to the residue will not cause harm.

Bt crops registration process--a timeline

1995—EPA grants a time-limited commercial registration for the first Bt corn and cotton ending in 2001, effective at the end of the 2000 growing season.

September, 2000—EPA publishes an assessment of risks and benefits, including verbatim quotes from an industry submission.

October, 2000—EPA’s science advisors review EPA assessment and criticize the quality of the assessment, stating that there was lack of data on impacts on monarch butterflies.

January, 2001— Unable to finish a proper assessment for the 2001 growing season EPA, grants a one-year renewal ending on September 30, 2001.

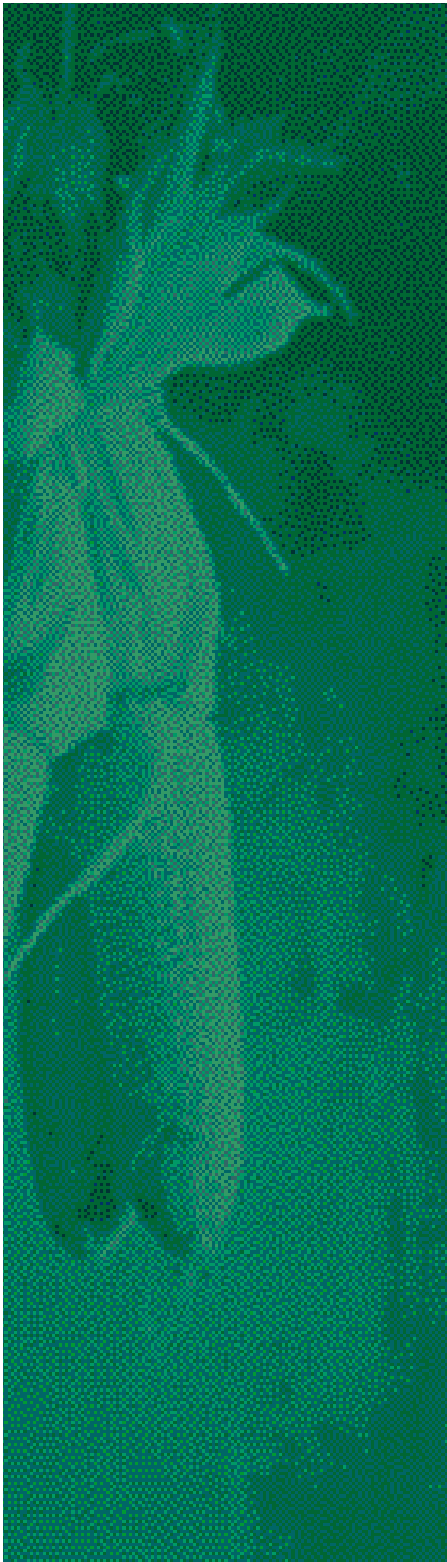
March, 2001—EPA’s science advisors release a report, reviewing the impacts of Bt crops and the agency’s registration plan.

July, 2001— EPA releases portions of its reassessment document and announces a 45-day public comment period ending on August 31, 2001.

September, 2001—EPA to announce registration decision for Bt crops.

EPA now has several registration options:

1. EPA can choose not to renew the registration of all Bt crops and not allow any more commercial plantings because of the lack of safety data currently available.
2. EPA can choose not to renew the registration of the Bt crops but allow them to be planted for one more season if there is insufficient non-genetically engineered seed available for commercial planting.
3. EPA can extend the registration of the Bt crops for another year, and make a determination next year based on new data.
4. EPA can extend the registration of the Bt crops for several years.



Impacts on Agriculture

Fueled by intense consumer opposition, many European and Asian countries have imposed prohibitions or restrictions on the importation of genetically modified organisms (GMOs), including plants. These market closures and trade restrictions have already placed U.S. corn producers at a competitive disadvantage in the global marketplace.

Statistics compiled by the U.S. Department of Agriculture's Foreign Agricultural Service indicates that U.S. corn exports were 9% behind last year as of June 7, 2001.² U.S. corn exports to Japan, Taiwan and South Korea were 88,559,390 bushels (2.247 million metric tons) behind last year's statistics for the same time period. Corn sales to the European Union have plummeted since the introduction of GMOs. In the 1996 marketing year the EU imported 109 million bushels of U.S. corn. Last year U.S. corn exports to the EU fell to 2.7 million bushels, and as of June 7, 2001, only 90,000 bushels had been exported for this marketing year. EU still imports more than 100 million bushels of corn annually. However, those markets - formerly the exclusive domain of U.S. corn producers - have been taken over by farmers from Brazil, China, and Argentina, who produce and market GE-free corn.

Consumer opposition and the loss of foreign markets from GMOs are of great concern to corn producers. In a June 2001 survey conducted by the American Corn Growers Association, 77% of farmers responding felt that consumer and foreign market concerns were important issues, of which 74% believed that consumer rejection of GMOs contributes to the ongoing low prices paid to corn growers.³ Of the corn producers surveyed, 56% believed that Congress should enact GMO labeling laws to meet consumer demands and to improve market-ability.

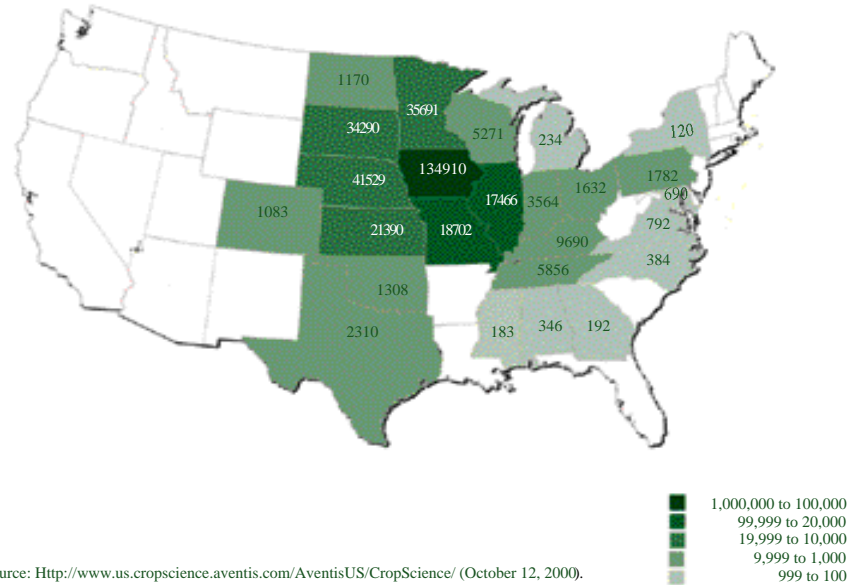
Human Health Concerns

Genetically engineered crops, including Bt pesticide plants, pose special risks to human health. Some problems stem from the technology itself. Bt corn, for instance, is engineered by use of a gene gun, which randomly shoots the foreign gene into the plant's cells. Scientists don't know if or where the foreign gene will be spliced into the plant's DNA, or how many copies of the gene will be inserted. Such haphazard introduction of foreign genetic material can disrupt the plant's metabolism, sometimes resulting in "pleiotropic" or unplanned outcomes such as subtle nutritional changes or increased production of naturally occurring toxins or allergens.

Bt plant pesticides could act like allergens

Over the past decade, the scientific and medical communities have become increasingly concerned about the potential of genetically engineered foods to cause allergies. GE foods often produce "novel" proteins that are new to the human diet and are most often derived from bacteria, as is the case with all Bt crops. Allergies are triggered by aberrant immune system responses, which often occur when a susceptible person is exposed to a new food (or food protein). It is thought that food allergies afflict 2-2.5% of adults and 6-8% of children, or about 8 million Americans.⁴

Estimated Acres of StarLink Corn



Source: <http://www.us.cropscience.aventis.com/AventisUS/CropScience/> (October 12, 2000).

Food allergies are becoming more common, for reasons still unknown. Because GE foods introduce novel proteins, and the process of acquiring allergies is still poorly understood, a growing number of experts recommend labeling genetically engineered foods and monitoring for potential allergic reactions after market introduction. Mandatory labeling would entail “identity preservation” or “traceability” of genetically engineered crops from field to table. Such a labeling regime would enable doctors to track possible allergic reactions to GE foods to their source, something that is currently impossible in the U.S.

Allergenicity and StarLink

StarLink is a type of genetically engineered Bt corn that produces a pesticidal protein called Cry9C. Although StarLink was approved by EPA only for use as animal feed, it entered the human food supply because its developer, Aventis CropScience, violated its stewardship agreement with the EPA. Cry9C is a suspected human food allergen. Expert advisors to EPA recently stated that even billionths of a gram of Cry9C in foods cannot be considered safe, and have called on the FDA to step up its investigation into Cry9C’s potential health impacts.⁵ All pesticidal Bt crops produce Cry proteins closely related to StarLink’s suspected allergen.

Crucial allergenicity testing still hasn't been done

EPA's science advisors reviewed two studies that suggest that all Bt crops may be allergenic. In their report released in March 2001, they stated, "These two studies suggest that Bt proteins could act as antigenic and allergenic sources."⁶ When questioned at EPA's only public hearing on this subject in July, 2001 about whether the agency had further investigated this issue, the answer was "no." EPA's science advisors have consistently called for surveillance and allergy testing of high-risk groups such as farm/mill workers and children. The agency has had the ability for several years to design and conduct allergenicity testing.

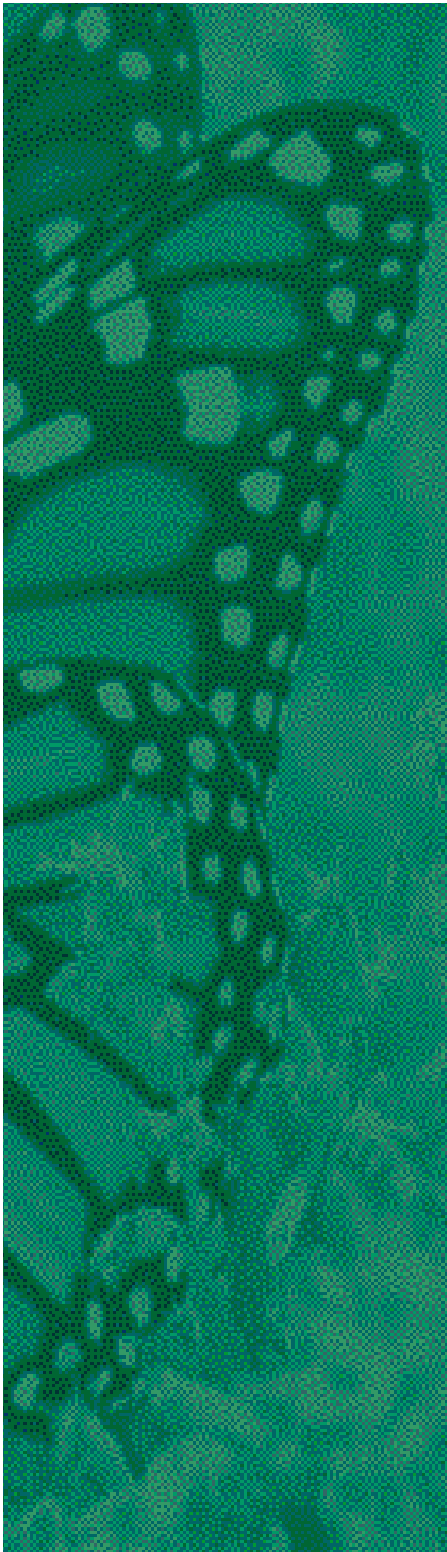
Instead of testing the pesticide actually produced in the plant, biotech companies use a bacterial-produced surrogate version for testing in order to save money. As was found with StarLink's Cry9C, the plant-produced protein can differ substantially from the bacterial version in ways that may make the plant protein more allergenic. The National Academy of Sciences and other expert bodies have recommended that testing be conducted on the plant-produced protein itself. EPA continues to accept tests conducted on bacterial surrogates even though such tests fail to lay to rest questions about the protein.⁷

One way to judge whether a genetically engineered protein may cause health problems is to compare its structure to those of known allergens and toxins. This simple procedure has not been conducted for any of the Bt crops up for re-registration. EPA has not requested the laboratory studies needed to determine the structure and properties of these plant pesticides and biotech companies have not even confirmed the structure of their plant pesticides through sequencing. Additionally, Monsanto has failed to determine whether the pesticide produced in its Bt corn is heat-resistant, a characteristic of food allergens.⁸

Instead of thorough testing, EPA relies heavily on a "history of safe use" of Bt sprays in judging Bt plants to be safe. There are at least two serious objections to this standard. First, the plant-produced pesticides are usually activated toxins, which are quite different than the inactive "protoxins" found in Bt sprays. Second, without controlled studies examining the potential health impacts, and in the absence of labeling that would permit a consumer to trace back an allergic reaction to its GE source, there is no scientific basis for claiming that Bt crops on the market are safe. Just as the government has been unable to determine whether StarLink's Cry9C is allergenic, so too do all 20 million acres of pesticide plants represent additional potential of an allergenic source.

Environmental Concerns

Bt crops may cause a number of potentially significant environmental impacts. Two primary concerns with insecticide-producing crops are the effects they may have on non-target, beneficial insects, such as monarch butterflies, and the fact that widespread use is likely to create resistance in insects that the Bt crops are meant to control. Other potential problems include build-up of Bt in the soil, with unknown long-term effects, crossbreeding with nearby weedy relatives or other crops, and increased pesticide use in the long term.



Bt crops affect butterflies

In many Bt corn varieties, the Bt toxin is produced in most of the plant tissues, including pollen. Since monarch caterpillars do not feed on corn, they might be expected to be in no danger from Bt corn. However, Bt corn pollen, like any corn pollen, is blown by the wind onto milkweed and other plants in the vicinity of Bt-corn fields. Milkweed is the sole source of food for the monarch larvae.

In May 1999, the journal *Nature* reported that researchers from Cornell University found that monarch larvae feeding on milkweed dusted with Bt corn pollen had a 44% mortality rate and that survivors were stunted. These laboratory findings were reinforced by a subsequent field study conducted at the University of Iowa, which reached similar findings.⁹

Six months later, it was revealed that EPA had not required tests on the effect of Bt pollen on “non-target” butterfly larvae before the agency approved commercialization of Bt corn. Millions of acres of the crop were planted.

Then, in October 2000, EPA stated that a review of all available scientific information indicated that monarch butterflies are at very little risk from Bt corn.¹⁰ However, EPA’s science advisors took the agency to task for this premature conclusion. The science advisors acknowledged that the agency had based its conclusions on data available at the time, but the lack of that data should have led the agency to reach no conclusions on the possible effects of Bt corn on the butterflies.¹¹ Currently, EPA has not released the controversial monarch data for public review.

New scientific information also raises concerns about endangered and threatened species of moths and butterflies that may encounter potentially toxic Bt pollen. Of particular concern is the population of Karner Blue butterfly (*Lyaecides melissa samuelis*), which is listed as endangered. The Karner Blue, like the monarch, often lives adjacent to cornfields.¹²

Other impacts on insects

According to *The Journal of Environmental Entomology*, studies conducted in 1999 at the Swiss Federal Research Station for Agroecology and Agriculture in Zurich found that the mortality rate of the beneficial green lacewings larvae increased after eating Bt toxin similar to that found in Bt corn.

Other studies have also suggested that increased mortality among insects due to the introduction of genetically engineered Bt crops could reduce the food supply for insectivorous birds or other insect predators, such as bats.¹³

Bt soil impacts

Healthy soil contains a large array of microscopic organisms that include bacteria, fungi, protozoa, insects, nematodes and other species. All contribute to recycling biological waste and providing essential elements for plant growth. New York University researcher Guenther Stotzky and others have found that transgenic Bt toxin binds to soil particles and remains toxic for up to 234 days.¹⁴ Only a limited number of studies are currently available that examine impacts of Bt on soil organisms, and there is inadequate data for any meaningful assessments of the impacts of Bt toxin on soil ecosystems.

Monarch Update

Bt corn pollen and monarchs—the bad news and the good news

The bad news:

Recent EPA and industry documents show that one of the Bt-corn types approved by the agency is toxic to monarchs. This fact raises further question on EPA's regulatory program ability to identify risks to the environment from Bt crops—before approval and commercialization.

According to recent EPA and industry documents, pollen from Event 176 Bt corn, approved by EPA in 1995, is quite toxic to monarch butterfly larvae. Incorporated into both field corn and popcorn varieties, Event 176 was developed by Novartis (now Syngenta) and Mycogen (now Dow AgroSciences). Syngenta and Dow have informed EPA that they are phasing out Event 176 varieties—allowing their commercial permits to expire this year. However, EPA is allowing the companies to sell existing seed stocks for two more growing seasons (through 2003).

The good news (at least in the short term):

Pollen from the two other types of Bt corn currently on the market, Bt11 and Mon810, appears not to be toxic to the butterfly, at least in the short term. Syngenta markets Bt11 in both field corn and sweet corn varieties; Monsanto sells Mon810 in field corn only. These Bt-corn varieties account for a significantly larger share of the Bt-corn market than Event 176 varieties.

EPA's initial evaluations in the mid-1990's did not even consider risks toxic pollen to monarchs.

What still remains unknown is whether or not pollen from these two types of Bt corn negatively impact monarchs in the long-term. For example, there have been no long-term studies of the effect on monarch reproduction or migration.

Insect resistance to Bt crops

Bt crops produce the toxin throughout the plant's life. Consequently, the pests' ongoing exposure to Bt promotes development of resistance to the toxin. This happens because the individual insects not killed by the Bt will survive and reproduce. Over many generations, the number of resistant pests increases. This change in pest populations can render both Bt crops and sprays ineffective. Bt resistance has already been noticed among some insect populations.¹⁵ Scientists generally agree that widespread use of Bt crops will lead to widespread insect resistance in a few years.¹⁶

Bt crops and pesticide use

The primary reason that Bt crops may not fulfill the biotech industry's promise of reduced pesticide use is the high likelihood that insects will become resistant to Bt toxin. This could have a doubly troublesome result: first, a return to synthetic pesticide use and, second, the loss of Bt sprays as a pest management tool for both conventional and organic farms, due to increased insect resistance. There is a third problem as well. There has been a marked increase in pests not controlled by Bt crops that have thrived during the initial reduction of reduced pesticide use. In this case, farmers may be forced to use additional pesticides to control these pests.

EPA's Comment Period and Assessment Inadequacies

Registrations of Bt crops are subject to major shortcomings. For example, EPA generally relies on the use of research provided by, and often conducted by, the applicant, potentially compromising its validity. Tainted industry research for pesticide registrations has long been a problem. In the case of GE pesticides, a peer-reviewed report released by EcoStrat, an independent Swiss scientific assessment firm, indicated that the agency accepted inappropriate and scientifically questionable studies in approving the first Bt corn for U.S. growers.¹⁷ The report states that studies submitted by Novartis and Mycogen to determine the effect of Bt corn on non-target insects were so poorly designed that there was virtually no chance that adverse effects would be observed.

EPA first approved pesticide plants, starting in 1995, without demanding the studies required to determine their potential impacts on human health and the environment. Now, six years later, crucial data is still lacking as the re-registration deadline rapidly approaches.

The review and registration process has been less than the transparent, open, full public participation promised by the agency in the years leading up to the renewal decision. The agency started the clock on a 45-day comment period despite its failure to release all the documents on which it sought comment. For example, the agency allowed the industry to withhold key Monarch butterfly data under the claim that it was confidential business information. The agency has made no promise that it will make the data available to the public before the end of the comment period on August 31, 2001.

WILL GENETICALLY ENGINEERED CROPS FEED THE WORLD?

Biotechnology companies have mounted a \$52 million public relations campaign to give biotech foods a friendly face. Among other arguments, industry is claiming that genetically engineered foods will feed the world. However;

- * **In 1999, 99 percent of all genetically engineered crops were grown to enhance the plant's pest management traits, not to increase yield or nutrition value.¹**
- * **According to a U.S. Department of Agriculture report, 98 percent of genetic alterations are done to make food production and processing easier and more profitable for the manufacturers.** Only two percent are aimed at improved nutrition or taste. In general, these crops are being engineered to increase corporate profitability, not designed to alleviate world hunger.
- * **GE crops result in a lower yield and higher prices.** According to an independent, yield study conducted by Dr. Roger Elmore of the University of Nebraska, Monsanto's Round-Up Ready soybeans yield 6 percent less than their closest relatives did and 11 percent less than high yielding conventional soybeans². For some farmers, the decision to grow GE crops will nearly double their spending on seeds and weed management systems including both direct and indirect costs.
- * **The leaders in biotechnology are the same giant chemical companies — Monsanto, DuPont, Aventis and Novartis — that sell toxic pesticides and herbicides.** These companies are genetically engineering plants to be resistant to herbicides that they manufacture so they in turn can sell more herbicides. Farmers in both developed and developing countries will become increasingly dependent on the industry to provide them with the materials necessary to continue their livelihood.

The problems surrounding world hunger have more to do with food distribution than food production. The world today produces more food per inhabitant than ever before. Enough food is available now to provide 4.3 pounds for every person each day.³

¹ Global Status of Commercialized Transgenic Crops: 1999. *ISAAA Briefs* No.12: Preview. ISAAA: Ithaca, NY.

What Should EPA Do?

EPA should announce that the registrations for all Bt crops are being suspended until adequate research has been conducted regarding their environmental and human health risks. This means that the agency should continue to consult with biotechnology companies, independent scientists and researchers, and the public to determine what research is necessary, who will conduct it, and how the results will be analyzed and used.

Only if research clearly demonstrates that the public will benefit from this technology, and that risks can be properly managed, should there be any commercial planting of Bt crops. Until that time, EPA should cancel all registrations on Bt crops.

GEFoodAlert coalition, along with other environmental, farm, and food safety advocates, is encouraging all concerned citizens to submit comments to EPA before the deadline on August 31, 2001.

ENDNOTES

¹ National Agriculture Statistic Services, *Acres Report*, June 29, 2001

² United States Department of Agriculture Foreign Agriculture Service, U.S. Export Sales, June 7, 2001

³ 2001 ACGA Corn Producers Survey: GMOs and Markets, American Corn Growers Association, July 10, 2001

⁴ Percentages from: "Assessment of Scientific Information Concerning StarLink Corn," FIFRA Scientific Advisory Panel Report No. 2000-06, issued December 1, 2000, p. 11. The 8 million figure is calculated from the percentages using US Census data on adults/children.

⁵ "Assessment of additional scientific information concerning StarLink corn" Scientific Advisory Panel SAP Report No. 2001-09, July 17-18, 2001.

⁶ "Bt Plant-Pesticides Risk and Benefit Assessments," FIFRA Scientific Advisory Panel Report No. 2000-07, issued March 12, 2001, p. 76.

⁷ "Genetically Modified Pest-Protected Plants: Science and Regulation," National Research Council, an arm of the National Academy of Sciences, 2000, p. 65; "Mammalian Toxicity Assessment Guidelines for Protein Plant Pesticides," FIFRA Scientific Advisory Panel Report No. 2000-03B, issued September 28, 2000, pp. 13-14; EPA's "Bt Plant-Pesticides Biopesticides Registration Action Document," Product Characterization section, pp. IIA3-IIA-4

⁸ EPA's "Bt Plant-Pesticides Biopesticides Registration Action Document, Human Health Assessment section, Table B1, p. IIB3. What the EPA regards as "confirmatory studies needed to complete product database" are actually studies that should have been conducted years ago *before the initial registrations* to supply crucial information for evaluation of the potential allergenicity/toxicity of Bt proteins. On sequencing, see the "Mammalian Toxicity..." report cited in reference 7, p. 14, where the SAP states that the method accepted by EPA, "the sequence analysis of 10-15 N and/or C-terminal amino acids..." is "highly undesirable."

⁹ Jesse and Obrycki. 2001. Field deposition of Bt transgenic corn pollen: Lethal effects on the Monarch butterfly. *Oecologia* 125: 241-248.

¹⁰ Safford. "Advisory Panel Criticizes EPA Claim that Bt Corn Does NOT Harm Butterflies," Bureau of National Affairs (BNA), Volume 23 No. 22, October 25, 2000.

¹¹ Ibid.

¹² See generally, Raffa, Kenneth F. 1989. Genetic Engineering of Trees to Enhance Resistance to Insects, *BioScience* Vol. 39, No. 8 at 532-533

¹³ Hilbeck, A., Meier, M. S., Raps, A. "Review of Non-Target Organisms and Bt Plants," Report to Greenpeace International, EcoStrat GmbH, April 2000. See http://www.greenpeaceusa.org/media/press_releases/gmo-report-complete.pdf.

¹⁴ Saxena, Flores, and Stotzky. "Insecticidal toxin in root exudates from Bt corn." *Nature*, Vol. 402. 2 December 1999. Saxena and Stotzky. "Fate and Effects of the Insecticidal Toxins From *Bacillus Thuringiensis*," *ISB News*, May 2001 Saxena, Flores, and Stotzky. "Insecticidal toxin in root exudates from Bt corn." *Nature*, Vol. 402. 2 December 1999.

¹⁵ B.E. Tabashnik, "Evolution of Resistance to *Bacillus thuringiensis*", *Annual Review of Entomology*, Vol. 39, 1994, pp. 46-9.

¹⁶ Mellon, M. and J. Rissler, eds., *Now or Never: Serious New Plans to Save a Natural Pest Control*, Union of Concerned Scientists, 1998