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Biopharm Crops--Brave New Transgenics

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Brave New Transgenics

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Just when the global diatribe over food and genetically modified crops (GM) is heating up in tone and breadth, the corporations that create them are staging a showcase for a fresh batch of transgenics.

These new GM crops, known as biopharmaceuticals, or biopharms for short, produce industrial and pharmaceutical chemicals within their tissues. The plants, including soy, rice, corn and tobacco, are genetically altered to produce substances such as growth hormones, curdling agents (coagulants), vaccines for humans as well as farm animals, human antibodies, industrial enzymes, contraceptives and even pregnancy deterrents.

Scientists and corporations alike embrace biopharmaceuticals with glee. "Imagine being able to harvest enough globulin (a compound that fights arthritis) for the whole world in all of fifty acres?", writes Dr. William O. Robertson for the Seattle Post-Intelligencer. "Imagine being able to find the protein healthy people use to prevent arthritis or breast cancer and being able to produce it in large quantities in rice and tobacco."

ProdiGene, a leader in the field, calculates that by the end of this decade, 10% of the corn produced in the US will be biopharmaceutical. The volume of biopharmaceutical drugs and chemicals could reach the 200 billion dollar figure, according to Dow AgroSciences scientist Guy Cardinau.

Warning Calls

But some scientists and ecologists are concerned. Will it be possible to contain and segregate such crops, fruit and seed, in order to avoid a biological Chernobyl?

Is there any guarantee that these products won't accidentally end up at the supermarket? How can we keep their pollen from fertilizing other fields and reproducing out of control?

"One single mistake from a biotechnology company and we'll be having someone else's prescription medicine for breakfast in our cereal," warns Larry Bohlen, spokesman for Friends of the Earth, an international ecology organization.

"What will happen if the pollen of a transgenic plant containing some kind of drug fertilizes a nearby edible crop?" argues the Erosion, Technology and Concentration Action Group (ETC) in a report published in 2000.

The report continues to ask: "How will the soil microorganisms and insects which benefit agriculture be affected by crops which are genetically designed to produce industrial and pharmaceutical chemicals? What will happen if animals eat the biopharmaceutical crops? Will the biopharmaceutical proteins be altered during the various stages of growth, harvest and storage? Will they cause allergic reactions?"

According to biologist Brian Tokar, professor at the Institute for Social Ecology, the most serious problems concern cross-pollination and unknown effects to insects, soil microorganisms and other native life-forms.

A Little Mishap In Nebraska

There have been mistakes with these crops already. In November 2002, at an agricultural cooperative in Aurora, Nebraska, 500,000 bushels of soy were contaminated with biopharmaceutical corn. One of the coop members harvested

an experimental batch of corn for ProdiGene the year before and then proceeded to plant a crop of soy for human consumption in the same field.

During a routine inspection, federal officials from the Department of Agriculture found the corn stalks for ProdiGene growing among the soy plants. By the time they made the discovery, soy from that field was already being stored mixed with the soy of other coop members. Fortunately, the authorities were able to segregate the contaminated grain just before it reached the supermarket aisles.

The company was slapped with a \$500,000 fine for negligence; yet, and in spite of such gross near disaster, the government still allows the corporation to continue with biopharmaceutical research as well as keeping the precise nature of the contaminating batch in Nebraska a trade secret. Mark Ritchie, president of the Institute for Agriculture and Trade Policy, describes the incident as the "Three Mile Island" of biotechnology, in reference to the emergency caused by a nuclear reactor in the 70's.

After the ProdiGene scandal, two industrial corporations which had so far supported transgenic research began to reconsider their positions. The Grocery Manufacturers Association, a group which represents supermarket distributing companies, expressed concern about the possibility that biopharmaceuticals could end up contaminating food supplies; such concern was also shared by the National Food Processors Association. The president, John Cady, requested strict and mandatory regulations in order to protect food products from being contaminated by biopharms.

Other people don't share such concerns. The Biotechnology Industry Organization, a group that represents biotech companies, and the American Farm Bureau Federation, an organization dedicated to Big Farming, are currently lobbying in Washington to obtain support from the federal government in order to slacken biopharmaceutical legislation.

Biological contamination

Transgenic products not apt for human consumption have already contaminated the food chain. At the end of the year 2000, environmental and consumer advocacy groups in the United States discovered that hundreds of American products in the supermarkets had been contaminated with traces of Starlink, a genetically enhanced GM corn that was declared unfit for human consumption by the Food and Drug Administration (FDA).

Although the Starlink strain was farmed in just 0.04% of the US corn production area, and was only meant for farm animal consumption, it ended up tainting 430 million bushels and to this day keeps showing up regularly in US exports.

"The Starlink discovery in Japan and South Korea, two of the most important US corn consumers, indicates that it could be found anywhere," remarks Meena Raman, from Malaysia, coordinator in Asia for Friends of the Earth Transgenics Program. "Until the US and Aventis (the biotechnology company that created Starlink) controls contamination, no other countries should allow corn imports".

A more severe case of genetic contamination is taking place in Mexico, where the presence of GM corn has been documented since 2001. It continues to show up in rural farming communities, both peasant and indigenous, sown by small farmers who are not aware of the transgenic threat; and it is proliferating rapidly, across wild and mixed varieties, in spite of the Mexican government's ban on transgenic crops, in effect since 1998. This contamination deeply concerns environmentalists, scientists and farmers, since Mexico is the cradle of corn and axis of its diversity, rendering the long term consequences on the environment and human health uncertain.

In Mexico, people are distressed by the possibility that biopharmaceutical corn could be introduced in the country. Silvia Ribeiro, of the ETC organization, expresses great annoyance about the California-based company

Epicyte, which ostentatiously declared having developed a spermicidal corn to be used as a contraceptive.

Ribeiro stated in La Jornada: "The potential of spermicidal corn as a biological weapon is outrageous, since it easily interbreeds with other varieties, is capable of going undetected and could lodge itself at the very core of indigenous and farming cultures. We have witnessed the execution of repeated sterilization campaigns performed against indigenous communities. This method is certainly much more difficult to trace."

We cover the world

Where are biopharms cultivated? All over the world. At the molecularfarming.com web page, investors solicit the collaboration of farmers willing to lease their land for biopharmaceutical experiments anywhere in the world. They have signed agreements in Brazil, Ireland, Australia, Greece, Zimbabwe, Panama and many other countries.

Activist Beth Burrows first denounced the claims at the Molecular Farming's web site. Burrows is president of the Edmonds Institute, a nonprofit dedicated to bioethics and biosecurity issues.

Award-winning journalist Devinder Sharma, an expert in agricultural and nutritional matters who lives in India, comments about the molecularfarming.com web page: "This is part of a global scheme to transfer dirty industries onto the Third World".

"First came the exporting of toxic and industrial recycled waste to developing countries in Africa and Southeast Asia. Now comes the biopharms. In the US there's a huge problem regarding these crops. What are they gonna do? Transfer dirty technology."

Don't worry, be happy

In spite of all this, biopharming advocates assure us they're perfectly

safe. Doctor Allan S. Felsot, an environmental toxicologist at Washington State University considers the use of plants to produce pharmaceuticals and other chemicals "not even a new concept, if we take into account that we've used medicinal plants for centuries."

Felsot insists there's nothing unusual about out breeding human proteins in the tissues of transgenic plants. "The proteins (in question) are the same found in our bodies. Most of them are used as medicine through cellular fermentation. They are very well defined and have been subject to exhaustive research and clinical trials on humans."

Doctor Robertson adds: "The possibilities boggle the mind, the opportunities are impossible to grasp in their totality and the risks appear minimal when they're compared with the risks we have encountered in medicine throughout the years."

What's ahead?

"What will have to happen before the Department of Agriculture takes seriously the fact that millions of people almost ended up consuming experimental drugs and chemicals?" asks Brandon Keim, of the Council for Responsible Genetics in reference to the ProdiGene scandal. "A few sensational deaths? Maybe an increase in debilitating disorders which will only be noticeable some decades later, when it's already too late?"

Biopharmaceuticals are in an experimental stage and the companies which produce them anxiously await the time when federal authorities will finally allow them to enter the market.

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