GENETIC CONTAMINATION CASE STUDIES

Genetically Engineered Rice in California

California agriculture is currently virtually free of genetically engineered commercial food crops. However, Bayer and Monsanto Corporations and other biotech companies are planning to introduce several genetically engineered varieties of California-grown grains, vegetables, fruits and nuts within the next several years.

Herbicide-tolerant rice, produced by both Bayer and Monsanto, is one California crop that is targeted for widespread commercial planting. In addition, Ventria Biosciences is planning to expand its production of a drug-producing rice variety beyond the limit allowed under its current research permit.

Farmers and consumers must carefully evaluate the risks associated with genetically engineered food crops. These risks include:

- *Contamination of other rice varieties and of the food supply*
- *Domestic and export market losses, and threat to consumer confidence*
- *Liability for farmers, handlers and manufacturers*
- *Development of weed resistance*

For a complete set of fact sheets on "Genetically Engineered Rice in California," which provide information on all of these considerations, please contact:

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Contamination of both genetically engineered (GE) and non-GE crops can occur at many points within the agricultural production system — in the production and delivery of seed, while planting, via cross-pollination while the crop is growing, and during harvest, handling, milling, storing and processing. After just a few years of widespread planting of GE corn, soy and canola, dozens of incidents of contamination have shown that the biotech industry cannot control GE crops. Pollen and seed from GE crops cannot be contained, and even small field trials of unapproved GE crops have resulted in massive contamination problems. The following two cases (and many others, see reverse) illustrate the dangers of GE contamination and the risks GE crops pose to farmers, consumers, and the environment.

StarLink Contamination: A Disaster for Corn Farmers

In September 2000, public interest groups announced test results showing that taco shells sold in supermarkets were contaminated with a variety of GE corn (StarLink) engineered with tolerance to glufosinate and to express the pest toxin Bt (*Bacillus thuringiensis*), but not approved for human consumption. Produced by the biotech company Aventis (now Bayer), the GE corn was approved for use in animal feed only, due to EPA concerns about possible human allergic reactions to the product. Further testing eventually showed that the food contamination was widespread. Though it was grown on less than 0.5% of all US corn acres, over 300 food products were recalled due to StarLink contamination, and experts in Iowa estimated that half of the state's corn – about 1 billion bushels – could be contaminated.[1]

Ultimately, the StarLink fiasco affected every corn farmer in the United States. Growers who planted the crop were stuck holding unwanted corn for months while the government and Aventis negotiated how millions of bushels of corn would be purchased and diverted to non-food uses. Farmers with fields neighboring StarLink corn were forced to test their harvest for contamination due to cross-pollination. Countless bushels of unwanted, contaminated corn were eventually identified (EPA admitted that over 2,000 farmers had their corn contaminated by StarLink growers who had included neighbors' fields as part of their required buffer zones[2]).

Even farmers whose crops were not contaminated were affected, since the US export market for corn plummeted due to lack of confidence in the integrity of American corn. According to USDA, sales of US corn to Japan at the end of 2000 were down about 21 percent from a year earlier, and by mid-April 2001, this gap had widened to 44 percent.[3] Meanwhile, Japan began importing more corn from Brazil, Argentina, China and South Africa.[4] Corn exports to South Korea, another major market, were also lower.[5]

Ultimately, Aventis was forced into a $110 million settlement in a class-action lawsuit filed on behalf of all US corn farmers, since these export losses affected every corn grower. But it appears that thousands of farmers will not be compensated, since many say they were unaware of the settlement and others say they could not navigate the complicated legal forms needed to make a claim.[6]

After the StarLink fiasco, an Aventis spokesperson admitted that there was no way to tell how long StarLink contamination would plague US farmers. "[N]o matter how diligent our collective efforts are we can never guarantee 'zero' [contamination]," he said.[7] In fact, in the summer of 2003, nearly three years after the contamination was revealed, the vice-president of the North American Millers Association said that StarLink was still showing up "every week and just about every day" in corn shipments,[8] creating problems in the food system since the tolerance for StarLink in human food remains at zero.

ProdiGene: Pharm Corn Contaminates Food Crops

Pharmaceutical crops, or pharm crops, are genetically engineered to produce drugs for humans or animals. In "pharming," crops produce proteins that are extracted and purified from the harvested crop and then used in experimental drugs. The crops are neither approved nor intended for human food consumption. Because they are grown in open fields, concern over contamination is high, but the biotech industry has repeatedly promised that pharm crops could be controlled.

An executive for ProdiGene, which calls itself the world leader in pharm crop production, told reporters that a StarLink scenario was impossible with his company's products since "[we will] control every single step."[9] A spokesperson for the biotech industry said that comparing pharm crops to StarLink is unfair, since pharm crops "are not really crops, they are laboratory facilities."[10] Another ProdiGene employee urged a reporter to "Make sure that people know we're doing our best to keep this stuff out of their food."[11]

But in the real world, these open field "laboratories" behave just like other plants, and ProdiGene's "best" wasn't good enough. In September 2002, USDA discovered a ProdiGene plot of pharm corn in Iowa growing near fields of natural corn. Fearing that gene flow from the pharm corn (engineered with an experimental pig vaccine) had contaminated the nearby food corn, the agency ordered 155 acres of corn destroyed. Alerted to ProdiGene's sloppiness, government regulators then checked its other fields and discovered that volunteer pharm corn from a Nebraska field trial had contaminated soybeans grown there. The soy was harvested and delivered to a local elevator, eventually leading to the quarantine and destruction of $3 million worth of beans.

[1]Two good early overviews on StarLink are Neil E. Harl, et al, "The StarLink Situation," IA State Univ at www. And "StarLink corn crisis sparks regulatory, market concerns," Food and Chemical News, October 30, 2000.
[2]www.epa.gov/oppbppd1/biopesticides/pips/old/stlink/corn_containment_program.pdf, p. 10
[3]William Lin, Gregory K. Price, and Edward Allen, "StarLink: Impacts on the U.S. Corn Market and World Trade," USDA ERS Special Article, at www.ers.usda.gov/publications/so/view.asp?f=field/fds-bby/
[4]Jae Hur, "US corn exports to Japan hit hard by StarLink," Reuters, August 31, 2001.
[5]Lin, et al, note 3; and Hur, note 4.
[6]Chris Clayton, "StarLink Corn Still Shows Up," Omaha World Herald, July 30, 2003.
[7]Knight Ridder, "Biotech Firm Executive Says Genetically Engineered Corn Is Here to Stay", March 20, 2001.
[8]Clayton, note 6.
[9]Anne Fitzgerald, "High-tech Growers Say They'll Take Precautions, But Foes are Worried About Contamination," The Des Moines Register, March 17, 2002.
[10]Lisa Dry of the Biotechnology Industry Organization, Quoted in Tom Abate, "Future pharmers," San Francisco Chronicle, August 12, 2002, p. E1.
[11]Aaron Zitner, "Fields of Gene Factories," Los Angeles Times, June 4, 2001.

A Short History of Contamination Cases

Following are just a few of the dozens of incidents in which contamination from GE crops caused seed or product recalls, and/or other problems for farmers and consumers.

May 1997
Monsanto is forced to recall 60,000 bags of canola seed when it discovers the seed contains unapproved gene-altered DNA, due to contamination from a planting error by a seed producer.

December 1997
Unapproved GE sugar beet from a Monsanto test field is sent to a sugar refiner, where it contaminates natural sugar sold for animal feed.

May 2000
Nearly 15,000 acres of farmland in five European countries are contaminated with unapproved GE canola when pollen from the unapproved variety blows into a non-GE seed producers' field. In addition, French authorities reveal that unapproved GE seeds have contaminated nearly 10,000 acres of corn planted there.

April 2001
Just months after the StarLink fiasco, Monsanto is forced to recall thousands of bags of canola seed contaminated with a GE variety not approved for sale to Canada's major export markets. Incineration is planned for over 10,000 acres of fields already planted with the unapproved crop.

July 2001
Austrian authorities order thousands of acres of corn destroyed when tests show contamination of non-GE seed by two unapproved GE corn varieties.

April 2002
Corn grown in Argentina and sold as corn flour in Europe is discovered contaminated with a GE variety that is not approved for planting in Argentina or for human consumption in Europe.

May 2003
Tests show that biotech crops have contaminated wheat grown in the US, even though GE wheat is not approved for marketing. Grain industry experts warn that approving GE wheat could mean the end of US exports to Europe and Asia.

July 2003
Over 100 farmers in Italy discover that the non-GE corn seed they planted was contaminated with an unapproved GE variety.