



The United States Agency for International Development

# Questions and Answers on U.S. Food Aid Donations Containing Bio-Engineered Crops

## Overview

### **What are bio-engineered crops and how widely are they grown in the United States and other countries?**

Bio-engineered crops are plants in which the DNA has been altered using modern molecular biology. Other names include transgenic, genetically engineered, living modified organisms (LMOs), or genetically modified organisms (GMOs). A number of bio-engineered crops are commercially available and widely grown in the United States, including: insect-resistant corn and cotton; herbicide-tolerant soybeans, corn and canola; and virus-resistant papaya and squash. The latest figures from U.S. Department of Agriculture estimate that in 2002, 75 percent of soybean acreage, 34 percent of field corn and 71 percent of cotton were planted with bio-engineered varieties. All together, bio-engineered crops were planted on approximately 88 million acres in the United States in 2002. Approximately 46 percent of the world soybean acreage, 7 percent of world corn acreage and 20 percent of world cotton acreage were planted to bio-engineered varieties in 2001.

### **What concerns are being raised by countries receiving U.S. food aid about bio-engineered crops?**

The governments of Lesotho, Malawi, Mozambique, Swaziland, Zambia, and Zimbabwe have expressed concern over the food and environmental safety of bio-engineered crops. U.S. food aid donations may contain bio-engineered corn and soybean products. The only whole grain in food aid donations would be corn. Their core concern revolves around fear of damaging their future agricultural trade with the European Union (EU). If U.S. donated maize kernels are planted by farmers accidentally or intentionally, the maize may pollinate local maize plants. This could lead to the new genetic material being introduced into the local maize varieties, including any crops grown for export or used in animal feed for livestock intended for export. These governments are concerned that once the current food deficit is overcome, and trade might resume, that the EU may unilaterally bar their maize or maize-fed animal exports. The governments of Malawi, Mozambique and Zimbabwe have agreed to accept U.S. food aid shipments of maize on the condition that it is milled prior to distribution. Swaziland and Lesotho are accepting whole grain maize. Only Zambia continues to reject any U.S. food aid donations containing bio-engineered products.

## Food Safety and Health

### **Are bio-engineered crops safe to eat?**

Yes. Foods produced from commercially produced bio-engineered crops in the United States have met rigorous food safety standards. The approach used in the United States to assess safety for human consumption for foods derived from bio-engineered crops is consistent with new international food safety guidelines proposed for adoption by the Codex Alimentarius Commission, a body sponsored jointly by the Food and Agriculture Organization and the World Health Organization. The primary focuses of food safety assessments include allergenicity, toxicity, and nutritional composition. To date, scientific evidence demonstrates that these commercially available bio-engineered commodities and processed foods are as safe as their conventional counterparts. The food safety assessments were conducted to evaluate potential risks for the multi-ethnic U.S. population, and the United States is not aware of any reason to suggest that these foods would be unsafe for populations in other countries. In addition, numerous other countries have approved bio-engineered crops as safe for human

consumption, including Argentina, Australia, Brazil, Canada, the European Union, Japan, Russia, Mexico, South Africa, South Korea, and Uruguay.

### **Are bio-engineered foods in the U.S. food supply?**

Americans have consumed bio-engineered crops since their introduction into the U.S. food supply in 1996. Corn and soybeans are two of the most prevalent crops in the U.S. food supply grown from biotech varieties and are found in a large percentage of processed food items. However, the major use of corn and soybeans in the United States is as animal feed. Canola oil is a commonly used cooking oil and is also used in processed foods. In the United States, harvested grain from many sources is mixed together, and bio-engineered crops generally are not separated from non-bio-engineered crops. Therefore, foods produced in the U.S. for domestic use and commodity shipments for U.S. food aid and other exports commonly contain products derived from bio-engineered crops. The food sent to southern Africa as food aid is the same food that is eaten by Americans every day.

### **Do bio-engineered crops cause allergic reactions?**

The potential of food derived from bio-engineered plants to cause allergies in sensitive individuals is an important element in the food safety assessments of bio-engineered crops. The foods derived from bio-engineered crops that are currently on the market and that may be part of U.S. food aid have been evaluated for possible allergenicity using a scientific approach that is consistent with the international approach being proposed in the Codex. New proteins in these crops have not been found to resemble allergens, and tests have shown that the native allergens in crops such as soybean have not been increased.

### **How rigorously are bio-engineered crops regulated in the United States?**

All of the bio-engineered crops that are currently planted in the United States have been rigorously reviewed for environmental and food safety by all relevant regulatory agencies including USDA's Animal and Plant Health Inspection Service, the Environmental Protection Agency, and Department of Health and Human Service's Food and Drug Administration. Each of these three agencies regulates a different set of issues related to the planting and consumption of bio-engineered crops. While these assessments were conducted to evaluate potential food safety and environmental impacts in the United States, it is expected that the issues are similar in southern Africa.

### **Are bio-engineered foods required to be labeled in a special manner?**

Once a bio-engineered crop has completed the U.S. regulatory process, the crop is normally treated like any other agricultural product, and food derived from that crop is not required to bear special labeling, unless there is a significant difference in the new food. For example, special labeling to declare the method of development for genetically engineered food products is not required in the United States because these products do not differ in any significant way from their conventional counterparts solely due to the process through which they were developed. Bio-engineered foods would be subject to labeling if they contain a new allergen, have altered nutritional characteristics (such as modified oil content), or require altered cooking, preparation, or storage procedures as compared to their traditional counterparts.

## **United States and Food Assistance**

### **Why doesn't the U.S. donate cash instead of food to food aid programs?**

The United States is able to grow food in enormous capacities. As the world's largest food exporter, the United States gives most of its food assistance "in-kind." That is, we send U.S.-produced food commodities abroad and have done so for nearly 50 years. U.S. farmers have widely accepted bio-engineered corn and soy varieties for their environmental and economic benefits. Therefore, U.S. commodity shipments of corn and soy for food aid and export markets are likely to contain bio-engineered crops.

### **Why don't we just send other food commodities besides corn to southern Africa?**

Corn is a staple food of Southern Africans, especially the people in rural areas who have been hit hardest by the current food crisis. The governments of the affected countries have requested corn. Of non-bio-engineered commodities available for donation, including wheat and sorghum, only sorghum is

considered an acceptable alternative, as it is a more common food for the people of the region. USAID procured and shipped 15,000 metric tons of sorghum to the region, which is scheduled to arrive in December 2002. Unfortunately, there are not sufficient quantities of sorghum available on the U.S. market to make a significant dent in the food shortages gripping Southern Africa.

#### **Why doesn't the United States agree to mill corn donations?**

The decision to mill corn provided through emergency food aid would be costly and could involve lengthy delays and increased storage losses. Milled grain on the U.S. market currently costs approximately twice as much as non-milled grain, not including the additional shipping costs related to shipping milled product. Incurring additional costs to mill food aid donations means that less food will be delivered and fewer people will be fed. Any milling supported with U.S. food aid funds must be conducted in the United States. However, the U.S. does not object to milling when supported by other donors. Local milling capacity in many areas of southern Africa is limited and milled grain is more susceptible to spoilage than whole grain. The government of South Africa has offered to mill 60,000 metric tons of U.S. corn destined for the affected region. This is a successful example of burden sharing, because of the large milling capacity for corn in South Africa and its proximity to the countries in need.

#### **Can food aid recipient countries source their donations from other countries besides the United States?**

The total amount of food required to address the food shortages in southern Africa is not available locally within the affected region, which means that imports will be needed to meet the shortfall between local supplies and current needs. Currently, global food grain surpluses are down, and prices are up. If the United States were to purchase the large quantities of grain required from the supplies in the region, prices would rise further, which would create additional hardship for those currently able to purchase food. Other major corn exporting countries, such as Argentina, South Africa and some member countries of the European Union, also grow bio-engineered corn varieties, which limits the supply of non-bio-engineered corn.

## **Trade and Agriculture**

#### **Will bio-engineered grain cross with local varieties if food aid corn is planted?**

If food aid grain is planted in Africa, it can cross-pollinate (or out-cross) with other maize varieties, but not with other local plants. The frequency of cross-pollinating with domestic maize in Africa will be low unless the food aid grain is planted close to or in fields with domestic maize. Maize pollen is relatively heavy and large, and most lands close to the parent plant. The pollen dries out quickly, losing viability within two hours. Furthermore, bio-engineered maize varieties adapted for the U.S. climate and growing conditions will likely not grow well in Africa, limiting their ability to cross-pollinate with local maize varieties.

Food aid grain is intended for immediate consumption and is not intended for planting. In some areas, such as Malawi, public notices have been distributed explaining that the corn is for consumption, and not for planting. However, locally harvested seed that had been stored for planting in the next season is likely to have been consumed as food, resulting in seed shortages and the possibility that food aid grain might be used as seed. The U.S. government, in cooperation with international organizations, is working to provide locally-adapted, quality, white maize seed to plant for the next growing season that would outperform food aid grain if planted.

U.S. food aid corn is comprised of hybrid varieties, which, if replanted, tend not to grow well due to loss of vigor. This would be true for non-bio-engineered corn varieties as well. Africans have a strong preference for white maize, and most will seek to plant white maize rather than the yellow maize varieties provided through U.S. food aid shipments.

#### **Is the U.S. biotechnology industry pushing its products on developing countries through food aid programs?**

There has been a major international public research effort for the development of the technology to solve numerous crop production and nutrition problems around the world. It is therefore unfortunate

that biotechnology is thought of only as a tool of multinational companies. Public research work is ongoing to improve staple crops such as cassava, potato, and rice with enhanced pest resistance, tolerance to environmental stress or nutritional characteristics. Where the technology has already been adopted, bio-engineered crops have allowed growers to increase yields, decrease costs and reduce pesticide use. Publicly supported development efforts involve U.S. universities and foundations, European research institutions, the Consultative Group on International Agricultural Research (CGIAR), and many other research institutions in developing countries. USAID supports the development of the technology, as one component of an agricultural development strategy. Among the goals of these efforts is to assist in building the capacity of developing countries to develop and implement biosafety regulatory systems for the sound management of biotechnology. Numerous developing countries, including several African countries, have requested assistance and support for the development of biotechnology, including the capacity to make informed decisions governing their use.

**Are there any restrictions on replanting seed from bio-engineered corn if it is planted?**

No. If food aid grain is planted, there are no restrictions on replanting the harvested seed. The grain provided as food assistance is meant for consumption, however, and is not well suited for planting. From a legal standpoint, patents on bio-engineered varieties are geographically limited and do not extend to the recipient countries of food aid. Although the maize varieties provided in food aid shipments would be expected to perform poorly in African growing conditions, there have been no genetic modifications to the seeds that would make it impossible to grow a crop. So-called "terminator technology" that renders harvested seed sterile has not been fully developed or implemented anywhere in the world.

**Does the Biosafety Protocol limit the planting or distribution of bio-engineered crops?**

The Cartagena Protocol on Biosafety will regulate the transboundary movement of "living modified organisms" (LMOs) into and within the party countries, when it goes into effect. The protocol will go into effect when 50 party countries ratify the agreement, which may happen in 2003. In addition, the protocol establishes an information-sharing regime to enable countries to understand potential environmental risks and make informed trade decisions. The protocol expressly states that Advance Informed Agreement (AIA) procedures do not apply when the shipment is "intended for direct use as food or feed, or for processing." Therefore, the AIA Procedures of the protocol will not apply to food aid shipments. Additionally, the protocol makes no explicit or implicit suggestion that commodity shipments containing bio-engineered products should be processed or milled.

## **Environment**

**Are bio-engineered crops safe for the environment?**

Each crop must be reviewed individually for environmental safety. All bio-engineered crops grown in the United States have undergone rigorous environmental review. Among the environmental safety issues that are assessed is the impact on biodiversity from the potential flow of genes from bio-engineered crops to either native plants closely related to the crop, or to crop varieties developed through traditional breeding methods. Genes do not move from bio-engineered crop plants to non-related plants such as from maize to vegetables or native flowers.

Bio-engineered crops have been approved for production in numerous countries around the world with different environmental farming conditions. In the Southern African region, South Africa has approved both yellow and white maize bio-engineered varieties for production after review of economic, environmental, and health safety. Bio-engineered crops have been grown the longest in the United States and studies indicate no significant environmental concerns. A recent review by the U.S.-based Council for Agricultural Science and Technology indicates that some bio-engineered crops have significant environmental benefits from reduced pesticide use and reduced soil erosion. Similar conclusions were reached by the U.S. Environmental Protection Agency in reviewing regulatory approval of insect-resistant bio-engineered crops.

**Do bio-engineered crops contain pesticides?**

U.S. farmers have adopted crop varieties that have been bio-engineered to be resistant to insects,

tolerant to herbicides, or both. Insect resistance is derived from a soil bacterium, *Bacillus thuringiensis* (Bt). Crop plants have been engineered to produce Bt proteins that are toxic to certain insects but are safe for humans and other organisms. Sprayable Bt insecticides are commonly used by organic farmers. Crops incorporating Bt insect resistance require less chemical insecticide use than conventional crops. Herbicide tolerance is also derived from soil bacteria. Herbicide tolerant crops are engineered to withstand the use of very effective herbicides that would otherwise harm the crop. In many cases, growers are able to use herbicides that are considered to be safer than many other commonly used herbicides. In addition, herbicide tolerant crops may allow growers to reduce the number of herbicide applications made during the season and facilitate the adoption of no-till farming practices that can reduce erosion and runoff.

#### **Does bio-engineered corn harm butterflies?**

The potential impacts of bio-engineered maize on non-target organisms, those organisms not intended to be controlled by the newly introduced trait, are assessed prior to commercialization. Testing is performed on several different organisms, including: honey bee, parasitic wasps, green lacewing, lady beetles, northern bobwhite quail, earthworm, spring tails, channel catfish and water fleas. For bio-engineered maize varieties currently commercialized in the United States, these tests indicated non-target organisms would not be at risk from Bt maize. Also, subsequent field studies have not shown any adverse effects to non-target organisms. After the commercialization of bio-engineered insect resistant maize in the United States in 1996, concern was raised about potential harm to certain butterfly populations, which are closely related to the target insects of bio-engineered insect resistant maize. Since that time, additional field studies have been conducted to address these concerns. These peer-reviewed studies indicated that there is no significant risk to monarch butterflies from environmental exposure to Bt maize.

#### **Do bio-engineered crops contain genes from animals?**

There are no bio-engineered crops currently marketed that were developed using genetic material from animal sources. Currently available bio-engineered crops were developed using genetic material from plants, bacteria and plant-specific viruses.

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