Genetic Engineering Will Not "Feed the World"

Many supporters of genetic engineering (also called genetic modifications or GM) argue that GM crops are needed to stop global hunger. They say the technology will increase crop yields and allow us to produce enough food to feed the world's growing population.

But the world already produces enough food to feed 10 billion people, which is the number our population is predicted to reach by 2050.[1] And where there is hunger, it is mainly a result of poverty and inequality, not insufficient food production.

The reality is that people go hungry today because they lack the money to buy food or because they do not have access to the land, water and the other resources they need to grow food themselves.[2] GM crops do not address these causes of hunger and, so far, they are not increasing global food production.

WHY NOT?

GM CROPS DO NOT INCREASE GLOBAL FOOD PRODUCTION

No GM crops on the market today have been genetically engineered with traits to increase yields. **88% of all GM crops are engineered to be tolerant to herbicides – herbicides that are sold by the same companies that sell the GM seeds.**[3]

The evidence to date shows that genetic engineering has not contributed to an increase in crop yields. Overall, conventionally bred non-GM varieties remain more effective and are less costly to develop. It is these seeds - not the GM traits added to them – that account for yield increases seen in crops like soy and corn.[4,5] This explains why yields for corn and canola in Western Europe, where GM varieties are not grown, have increased at a similar rate to, or higher rate than North America where production is dominated by GM varieties.[6]

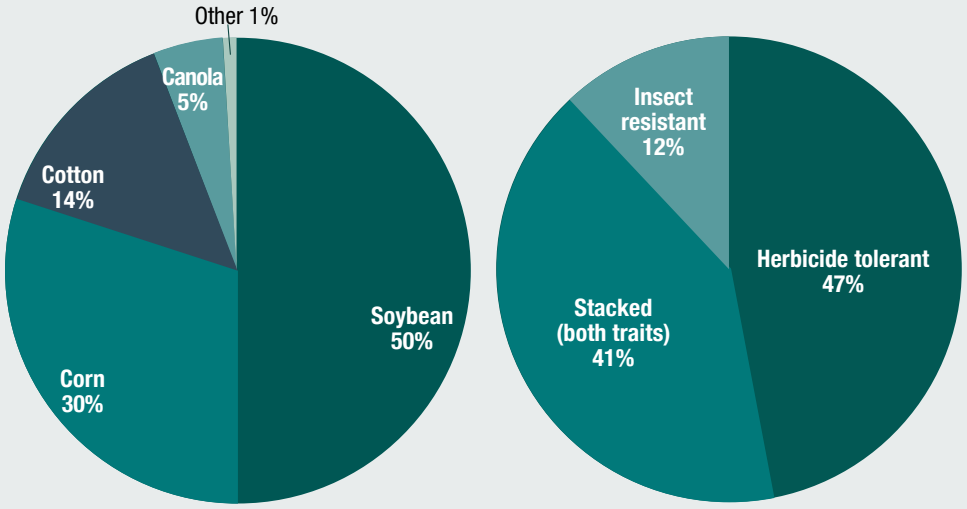
Four GM Crops

Four crops account for 99% of global GM crop hectarage: soy, corn, cotton, canola.

Two GM Traits

In total, 88% of the world's GM crops are herbicide-tolerant.

Data: ISAAA 2016 updated from gmoinquiry.ca/where



In the US, researchers have concluded that yield increases of corn and soy are due to improvements in traditional breeding, not the addition of GM traits.[7] In 2014, the US Department of Agriculture stated: "Over the first 15 years of commercial use, GE seeds have not been shown to increase yield potentials of the varieties."[8] Moreover, any advantages provided by GM varieties on the market are fading away as insects and weeds are increasingly overcoming the defenses these crops were genetically engineered for.[9]

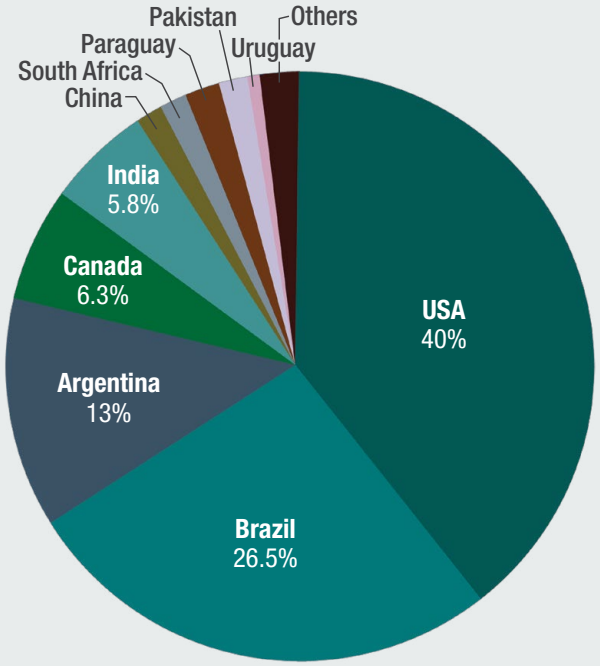
It is also important to note that much of the global GM crop production is not consumed directly as food. The four crops that account for over 99% of worldwide GM crop acreage (soy, corn, cotton and canola) are used primarily for processed food, animal feed, textiles and fuels for transportation.[10]

GM CROPS DO NOT IMPROVE FOOD PRODUCTION IN FOOD INSECURE COUNTRIES

Most GM crops have been designed for countries with large industrial farms and seed markets that are dominated by multinational corporations. Just three countries – US, Brazil and Argentina – grow 79% of the world's GM crops.[11]

Ten Countries

Ten countries grow 98% of all the genetically modified crops in the world. Most countries are not growing GM crops.



Data: ISAAA 2016 updated from gmoinquiry.ca/where

Most of the world's food – 70% – is actually produced by small-scale food producers, mainly under mixed and biodiverse farming systems.[12] GM crops are not designed for these farmers, who rely on farm-saved seeds adapted to local farming conditions and food cultures. GM seeds are patented and sold by multinational companies at high prices, and farmers are restricted from saving and using these patented seeds after harvest.

Just four companies account for 98% of global GM crop acres, and control over 75% of the global pesticide market.[13]

So far, the experience of small farmers in the Global South with GM crops has been extremely difficult. In India, GM insect-resistant (Bt) cotton seeds are three to eight times the price of non-GM cotton seed. The high price of GM cotton has increased debt problems for small farmers and contributed to farmer suicides.[14,15] This is especially the case when the GM cotton failed to perform as promised. The Indian Parliamentary Standing Committee on Agriculture's study of these GM seeds concluded that they "only added to the miseries of the small and marginal farmers."[17]

In Burkina Faso, West Africa, GM cotton seeds were introduced with heavy promotion in 2009, at a cost 18 times higher than non-GM cotton seeds.[18] However, farmers found that the Bt cotton crops did not yield well and needed pesticides, which further increased their costs.[19] In addition, national cotton companies could not sell the cotton because it had lower quality fibres.[20] By 2015, the cotton companies decided to phase out GM cotton production, and in 2017 no GM cotton was grown in Burkina Faso.

GM CROPS ARE NOT A SOLUTION TO HUNGER AND MALNUTRITION

There are ongoing efforts to develop GM crops with enhanced nutrition. The best-known example, and the one closest to introduction, is called "Golden Rice." It has been genetically modified to produce beta-carotene, which the body can convert into vitamin A. Developers and proponents argue that Golden Rice will help address vitamin A deficiency (VAD), a serious problem that affects an estimated 250 million preschool-age children and can lead to blindness and even death. Yet, after 20 years of research and millions of dollars, Golden Rice is still not ready for release.[21,22,23]

There are several existing, simpler and more appropriate ways to address vitamin A deficiency. The most basic strategy is to support access to local foods that are rich in vitamin A. For example, pre-school children can, on average, get their

daily requirement of vitamin A from 75 g of spinach, 2 tablespoons of yellow sweet potatoes, half a cup of most dark leafy vegetables, or two thirds of a medium size mango.[24,25] Several countries have also had fast success with food fortification and supplementation programs where one or two high-dose vitamin A capsules are administered to children every year. These capsules are effective, easy to administer, and cost pennies.[26] The Philippines, for instance, brought levels of VAD to below 5% through supplementation combined with food fortification, nutrition education programs, and encouraging home and school food production.[27]

Unfortunately there is no technological fix to hunger and malnutrition. Instead, new products like GM crops can exacerbate existing problems. There can also be new complications from the introduction of a GM crop like Golden Rice that could negatively impact food security – for example, the potential contamination of traditional rice varieties. A more sustainable solution would be to strengthen agricultural systems that support the cultivation of a range of crops needed for a healthy diet.

WHAT IS REALLY NEEDED TO FEED THE WORLD

"The right to food is not the right to be fed; it is the right to feed oneself in dignity."[28]

— Olivier De Schutter, former UN Special Rapporteur on the Right to Food

Small-scale food producers supply 70% of the world's food using less than 25% of the world's land, water, fossil fuels and other resources.[29] Any serious effort towards global food security must focus on ensuring these farmers, pastoralists and fisherfolk have the access to land, water and the other resources they need to feed their families and their communities. When it comes to seeds, it is particularly important that small farmers be supported to save, share and develop local varieties suited to local conditions and food systems.

Many farmers and other experts around the world are calling for diverse, sustainable and community-based agricultural development, based in food sovereignty and agro-ecology.[30]

Food Sovereignty is the right of all peoples to healthy and culturally appropriate food, produced through sustainable methods, and the right of people to define their own food and farming systems.

Agro-ecological food systems have incredible potential to produce enough high-quality food for all, while also supporting rural communities, building biodiversity and addressing climate change.

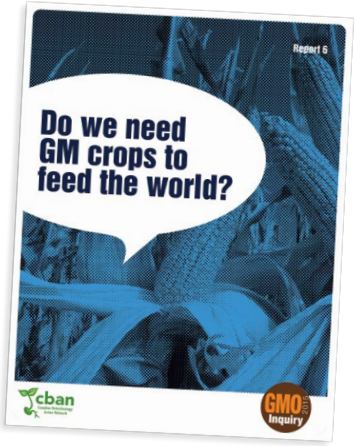
MORE RESOURCES FROM CBAN:

CBAN's *GMO Inquiry* report "Do we need GM crops to feed the world?: **www.GMOinquiry.ca**

Other resources and updates on this topic:
www.cban.ca/FeedingTheWorld

Factsheet and updates on Golden Rice:
www.cban.ca/GoldenRice

Information and updates on pesticide use with GM crops:
www.cban.ca/pesticides



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Provided by the Canadian Biotechnology Action Network (CBAN)

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The Canadian Biotechnology Action Network (CBAN) brings together 16 organizations to research, monitor and raise awareness about issues relating to genetic engineering in food and farming. CBAN members include farmer associations, environmental and social justice organizations, and regional coalitions of grassroots groups. CBAN is a project on Tides Canada's shared platform. **www.cban.ca**