Friends of the Earth International

QUESTIONS AND ANSWERS: WHO BENEFITS FROM GM CROPS?
February 2008

1. **Are GM crops contributing to the Millennium Development Goals of halving hunger and poverty by 2015?**
   There is no evidence that GM crops have made any specific contribution to the Millennium Development Goals. GM soya and cotton occupy the majority of the area planted with GM crops in developing countries – namely Argentina, Brazil, Paraguay, India and China. These crops are destined for feed and fibre exports to wealthy nations, not for food use. Therefore neither crop has directly helped to tackle hunger.

   GM crops have not performed better than existing conventional crops (e.g. they have not increased yields – see below), so it cannot be claimed that poor farmers and communities have received sustained indirect benefits, such as increased incomes.

   Furthermore, the reliance of the GM industry on patents for their crops means seeds are expensive and farmers are unable to save seed for the following year. This means GM crops are inherently unsuitable for poor, small-scale farmers. In the US, Monsanto has exploited these seed patents to claim tens of millions of dollars from US farmers for the 'crime' of saving seed.

   Hunger and poverty are complex political and social challenges. They are exacerbated more by lack of access to land, illiteracy and poor health-care than by deficient agricultural production techniques. Rather than contributing to the Millennium Development Goals, it is more likely that the corporate-led, industrial farming model promoted by GM crops, is in fact undermining them.

2. **Are GM crops benefiting small poor resource farmers in Africa?**
   The longest and best documented example of GM crops in Africa is the case of GM cotton in the Makhatini Flats area of South Africa. The ISAAA has portrayed this as a success story that proves the benefits of GM crops for small farmers in the continent. However, after more than 8 years of growing GM insect resistant (Bt) cotton in the Makhatini Flats, the number of small cotton farmers has plummeted from 3229 in 2001/02 to just 853 in 2006/2007. Bt cotton clearly cannot cope with the structural problems that are the chief causes of rural poverty.

3. **Does GM soya contribute to tackling hunger and poverty in South America?**
   The most widely planted GM crop, Monsanto's Roundup Ready soya, constitutes around three quarters of all GM crops grown in developing countries, mostly in Argentina, Brazil and Paraguay. GM soya is mainly destined for animal feed in rich export markets, not for human consumption. Soya cultivation is driving small farmers off the land and displacing acreage

planted to food crops and is reducing food security. For example, in Paraguay, the government's drive for an export-oriented agriculture focused on soya and cattle ranching has had a devastating impact on rural communities including deforestation, loss of land, forced displacements, and urban migration. Just 2% of landowners control 70% of land. The expansion of soy monocultures (90% of which is GM) has coincided with an increase in extreme rural poverty with up to 40% of people living below the poverty line.

Rapid expansion of soya cultivation in Argentina, virtually all of which is GM, has been accompanied by soil erosion, land concentration and a reduction in the number of family farms. Forests and savannahs have been cleared, and land previously devoted to pasture and food crops like maize, sunflowers, sorghum and beans has been converted to soya production, reducing Argentina's food security.

In Brazil, small farmers with a diversified farm have suffered contamination from GM soya crops, resulting in lost income. According to the government of the state of Parana, farmers are turning away from GM soya because of the increased costs of inputs and lower performance of the crop. And one of the worst cases of conflict between farmers and biotech companies took place in 2007; an armed security guard associated with Syngenta shot and killed a peasant farmer and injured six more, who were protesting peacefully at an experimental GM test site situated within the 10km buffer zone from the Iguaçu Falls World Heritage Site.

GM soya has not increased yields, and is associated with increased pesticide use. There is no evidence that GM soya has made any contribution to tackling hunger and poverty in South America.

4. Does GM cotton help alleviate poverty in India and China?

Besides GM soya, most of the remaining GM crop area in developing countries consists of GM insect resistant (Bt) cotton, namely in India and China.

In India the adoption of Bt cotton has been driven by hype-based "fads" and most of the rural population continues to be submerged in an agrarian crisis driven by water scarcity, low crop prices, poor infrastructure, poor access to credit and lack of rural employment. Bt cotton is not a food crop, and its seeds are very expensive. There have been 942 documented farmer suicides in 2007 alone related to crippling debt, something that studies have shown is exacerbated by the expensive GM seeds.

In addition, many GM cotton failures have been reported since its adoption. In China, reports have documented that hundreds of conventional cotton farmers have benefitted more than GM cotton farmers in past years. Xinjiang, the main cotton growing province, obtains the highest cotton yields and productivity in the entire country, and most of the cotton planted is conventional, not GM. This indicates that GM technology is not the main factor driving the best cotton performance in China.

5. Do GM crops yield more than conventional crops?

None of the GM crops on the market are modified for increased yield potential, as even the U.S. Dept. of Agriculture admits. And research continues to focus on new pesticide-promoting varieties that tolerate application of one or more herbicides. The main factors influencing crop yield are weather, irrigation and fertilizers, soil quality and farmers' management skills. Monsanto's Roundup Ready soya – the world's most widely planted GM crop – is modified for resistance to the herbicide glyphosate. Studies have shown that Roundup Ready soya suffers

from a “yield drag,” with on average 5-10% lower yields than conventional soya, as well as reduced uptake of essential nutrients.

In India, it has been reported that Bt cotton, developed for the short US growing season, loses its insecticidal properties late in India’s longer growing season, and that the Bt insecticide is not expressed in 25% of cotton bolls in India’s preferred hybrid cotton varieties. Reports of yield increases in Bt cotton have more to do with the weather, e.g. favourable monsoon rains, which have boosted production in several other crops as well.

6. Do GM crops reduce pesticide use?

The widespread adoption of Roundup Ready (glyphosate-tolerant) crops in the US has driven a more than 15-fold increase in the use of glyphosate on soybeans, maize and cotton from 1994 to 2005. In 2006, the last year for which data are available, glyphosate use on soybeans jumped by a substantial 28%. Increasing glyphosate use has driven an epidemic of glyphosate-resistant weeds, which in turn has led to rising use of other herbicides to control them. For instance, the amount of 2,4-D (a component of Agent Orange) applied to U.S. soybeans more than doubled from 2002 to 2006. The use of atrazine (banned in the EU due to links to health problems) on corn/maize increased by 12% between 2002 and 2005. Brazilian government authorities have documented an 80% increase in glyphosate use from 2000 to 2005, together with the rapid emergence of weeds that are resistant to the chemical. In India, a 2007 study concluded that Bt cotton did not reduce pesticide use.

7. Are GM crops making food cheaper?

There is no evidence to support claims that GM crops have made food cheaper. Most GM crops are produced for animal feed – or, in countries with no GM labelling laws – highly processed food, neither of which is affordable for poor farmers and communities. Commodity prices of crops, including soya and maize, have in fact increased dramatically in recent months (see Q. 8 below). The cost of purchasing GM animal feed is marginally lower than non-GM feed, but this difference is insignificant in the context of fluctuations in commodity prices and is not reflected in the final food product. For example, calculations in 2005 for the UK market have shown that sourcing non-GM feed for poultry results in a small increase of just 1.4 pence (1.9 cents) per kg, and for pork, 1.1 pence (1.5 cents) per kg – amounts that can easily be absorbed along the supply chain.

8. Do European Union GMO policy and laws make animal feed expensive and damage the livestock industry?

The rise in maize and soy prices is in fact caused by the shift to agrofuels, a rising global demand for animal feed and recent poor weather conditions, according to the UN’s Food and Agriculture Organisation. This is affecting many regions (Canada, Australia, US and China) and not just the EU.

Agricultural commodity prices are volatile and have been rising in previous years with particularly strong increases over the past year. The European Commissioner for Agriculture, the biotechnology industry and the livestock industry claim that the price rise in animal feed (maize and soy) is due to the time it takes to authorise GMOs for import, and because of the EU’s policy to reject any imports contaminated with unauthorised GMOs. They also claim that China represents a new threat as it will become the largest importer of soy and will be happy to import cheaper GM soy, thus making non GM soy difficult to source. However, China is not indifferent to GMOs and is tightening existing biosafety laws, whilst the leading food company Kraft has announced that its products for the Chinese market will be GMO-free. In addition,

China is already the world's biggest importer of soybeans whilst the EU is projected to remain the biggest importer of soymeal.

9. If there are so many problems associated with GM crops, why are they still grown on a large scale in some countries?

Large scale commercial farmers in the US and Argentina, who represent a small minority of the world's farmers, have benefitted from GM crops due mainly to the 'convenience effect'. This includes reduction in farm labour and increased flexibility in the timing of herbicide applications. The ability to farm more acres with less labour has facilitated the worldwide trend to fewer and bigger industrial-style farms. Whereas consumer demand in Europe (and labelling laws facilitating this demand) has resulted in food companies removing GM ingredients from their foods, GM crops can continue to be sold as animal feed because the products (milk, meat, eggs etc) do not have to be labelled in any country. Finally, in the U.S., increasing control of the seed supply by biotechnology firms means that farmers have ever fewer choices of high-quality, non-GM seeds.

10. What are the key features of the expansion of GM crops in the world today?

After 12 years of commercialization the majority of GM crops grown commercially remain limited to four crops, a few countries and just two traits. Significantly, biotechnology companies have not commercially introduced a single GM crop with increased yield, enhanced nutrition, drought tolerance or salt tolerance.

Four crops: GM soya, maize and cotton make up over 95% of world GM crops acreage. Virtually all of the rest is canola (or oilseed rape). Soya and maize are mostly used for animal feed in wealthy countries, not food.

Few countries: Over 90% of the area planted to GM crops is found in five countries in North and South America – the United States, Canada, Argentina, Brazil and Paraguay. The United States and Argentina, grow more than two thirds (over 70%) of all GM crops commercialized in the world, with the US alone accounting for over 50%. In the majority of other countries cultivating GM crops the area grown is a very small part of the total crop area –around 3% of the total crop harvested area in most of them.

Two traits: Virtually 100% of world acreage planted with commercial GM crops have one or both of just two traits: herbicide-tolerance and insect-resistance. Herbicide tolerant versions of soya, maize, cotton and canola represent 4 of every five hectares (81%) of GM crops grown worldwide. Monsanto's 'Roundup Ready' herbicide tolerant crops account for around 99% of all GM herbicide tolerant crops – around 80% of all GM crops worldwide.

11. Who is financing ISAAA?

The ISAAA is an organization supported by major biotech companies and agribusinesses, including Monsanto, Bayer, Dupont, Syngenta, Cargill, and others. With such a membership, it is not surprising that ISAAA in fact serves as a public relations agency for promotion of GM crops around the world.

However, it presents itself as "*a not-for-profit organization committed to alleviating hunger and poverty by sharing crop biotechnology applications with resource-poor, subsistence farmers throughout the developing world, and sharing knowledge on biotech crops with global society*".