

## Benefits of GM crops

Monsanto, as a company is committed to sustainable agriculture and development and recognises that there are many challenges in delivering the results of research to the great diversity of needs, conditions and farming types across the world. It is clear that a range of approaches will be required, and especially those involving partnerships.

Through our work in traditional breeding, Monsanto is delivering superior genetics (germ plasm) that allow farmers to get more out of each seed, resulting in the potential for higher yield. In addition, by inserting one or more genes in the seed — a biotechnology trait — we enable farmers to combat insects and control weeds more effectively, and with greater safety, so yield is preserved throughout the growing season.

Control of pests, diseases and weeds has always been vital to ensure crop productivity, whether through cultural, chemical or biological means. Molecular biology has opened up new tools through the use of both molecular marker and transgenic technologies. These same tools have the potential to deliver even greater gains through direct and indirect increases in yield, whilst maintaining or even decreasing demands on resources. The ability to deliver these tools will demand a diverse approach to business, and undoubtedly significant work through partnerships.

Technologies such as biotechnology, nanotechnology and marker-assisted breeding (MAB) are all used to develop new products for the market. Markers are used to identify specific genes to address a specific problem (such as drought or stalk-borer).

Insect and herbicide tolerance in crops provide many benefits. Analysis by [PG Economics](#) show that GM crops are credited with decreasing pesticide and fuel use, and with facilitating conservation tillage practices that reduce soil erosion, improve carbon retention and lower greenhouse gas emissions. Decreased inputs aren't just a savings and convenience for farmers; they offer significant environmental benefits for everyone:

- The reduction in greenhouse gas emissions associated with GM crops for 2006 is estimated to be equal to removing more than half a million cars from the road.
- On average, the volume of herbicide used on corn has dropped 20 percent since herbicide tolerant corn was introduced in 1996.

Monsanto truly believes that our herbicide tolerant crops promote carbon sequestration and fuel conservation due to reduced tillage. Tillage disrupts the soil as well as involving the use of fuel in

tractors. Using herbicides avoids that, while herbicide tolerant crops make the use of herbicides simpler.

High productivity agriculture, which, although the impact in the fields may be higher, the total area required to produce the food we need is less, thus freeing up areas which can be preserved as wildernesses, game reserves etc. Genetic modification of crops has led to higher overall yields and productivity, and we have seen a decrease, for example, in the number of hectares of commercial maize production in SA from around 3.5M in the early 1990's, to around 2.5 M now after the widespread adoption of GM maize hybrids. Furthermore the increase in yield has come with a drop in the use of insecticides and residual herbicides, which has also lessened the impact in the actual production fields. A significant part of the productivity increase we have see, can be attributed to GM technology.

The more efficient our agriculture, the more sustainable it will be. We need high productivity agriculture, practiced on fewer and fewer hectares, rather than less and less efficient agriculture, practiced on more and more hectares. This will allow us to preserve and enjoy biodiversity in set aside wilderness areas for generations to come, rather than being forced by inefficient agricultural practices to use more and more of our wilderness areas for food production.

## Concerns

We believe that many people still do not fully understand what biotechnology entails and what it can bring to communities world-wide. People often fear the unknown and are often sceptical regarding new technologies. There are also concerns regarding the environment and certain GM-crop traits being transferred to weeds, insects becoming resistant to Bt-crops, and of course economic risks and the cost of bringing GM-foods into the market. But, we believe education can bring more understanding and would, thus, wish to point to the following:

In South Africa, the Department of Agriculture, Forestry and Fisheries has implemented a regulatory system that analyses and monitors all potential impacts of GM technology. All applications are evaluated in terms of the GMO Act, Act No 15 of 1997 whereby all genetically modified (GM) crop plants to be used as foods or as food products are required by the South African GMO legislation to undergo thorough and rigorous food and feed safety assessment before they can be approved for commercial release. The GMO-industry is thus strictly regulated by legislation, regulations, trials and testing.

The safety assessment process of GM crops in South Africa as with most other countries that have adopted biotechnology is based upon principles developed through international expert consultations carried out by the World Health Organization (WHO) and the Food and Agriculture Organization (FAO) of

the United Nations, the Codex Alimentarius Commission and the Organisation for Economic Co-operation and Development (OECD).

According to the WHO reports on food safety, GM foods currently available on the international market have passed risk assessments and are not likely to present risks for human health. In addition, no effects on human health have been shown as a result of the consumption of such foods by the general population in the countries where they have been approved (<http://www.who.int/foodsafety/publications/biotech/20questions/en/>).

### Agricultural and food security in Africa?

According to the United Nations, the amount of food produced in the world will have to double by the year 2050, if we were to feed the expected population of 9,3 billion people. GM-crops seem to hold the solution, especially in countries where poverty, drought and land pose massive challenges. Food security depends not only on a one prone approach – Monsanto respect the choice of farmers and although we believe that good hybrids, excellent genetics and biotechnology can contribute towards food security, we acknowledge that other technologies and systems can also play a role and contribute towards food security.

We as a company recognises that there are many challenges in delivering the results of research and new technology to the great diversity of needs, conditions and farming types across the world. This diverse nature of farming in Africa, from large corporate operations to very small scale subsistence farming, means a diversity of business approaches. Since as many as 80% of African farmers are smallholder farmers<sup>[1]</sup>, much work in the short term also has to be achieved through donation and assistance programmes and we also believe partnerships to address these needs, are essential.

Monsanto will continue to be active in humanitarian efforts and will work to help address food security problems. Whether through the sharing of scientific information generally or a partnership focused on germplasm and technology, Monsanto will continue to consider requests and opportunities in all world regions.

Monsanto furthermore strives to provide simple, high technology solutions to all farmers – irrespective of the size of their enterprise as we believe technology is scale neutral. In fact, we have often seen in the past that the farmers who have less access to other technologies, benefits even more with the use of biotechnology.

### Seed prices

When it comes to seed, Monsanto's pricing is based on the value our products deliver compared to other available seed and crop protection products. We price our products annually with a goal of making farmers more profitable. Many aspects are taken in consideration when the price of a product is determined – such as cost of goods, benefits and value to the farmer. If a farmer does not receive the perceived value in a product, he will not buy it again.

**With regards to your question regarding biotech in Africa, we would like to point out the following:**

It is very important to realize that some 70 % of all small-scale farmers (1 ha and less) in Africa are making use of open pollinated varieties – and most often they also make use of farm saved seed. In other words, they keep seed back from the previous season, store it on farm often in poor conditions, and then plant them in the following season.

With regards to the rest of the market, as well as the emergent commercial farmers, they are served by several local and international the seed companies and hybrid seed. Most of the companies are also catering for these farmers, by selling the seed in 1 kg, 2 kg, 5 kg 10 kg, and the normal commercial bags of more or less 25 kg bags.

In Africa, commercially available biotech crops provide agronomic advantages such as pest resistance and herbicide tolerance. Monsanto's Bollgard® and Bollgard II cotton gives the plant built-in protection against bollworm while YieldGard® and YiledGardII maize protects the plant from stalk borers. Herbicide tolerance found in our Roundup Ready® cotton, maize, and soybeans frees farmers from mechanical weeding therefore saving on time and other resources. Monsanto's technology also permits the combination of these traits into a single crop plant. In this way, it is possible to have varieties which are both herbicide and insect resistant.

In Africa, South Africa, Burkina Faso and Egypt have commercialised our biotech crops. South Africa grows Monsanto's Bollgard® II cotton and YieldGard® as well as YieldGard II maize, Roundup Ready® soybeans, Roundup Ready® Flex cotton and Roundup Ready® maize as well as stacked-gene cotton and maize. Burkina Faso recently began planting Bollgard® cotton. In Kenya and Uganda, our Bollgard® cotton trait is being tested by the relevant government agencies with the hope that it will be commercialised some time in the near future. Monsanto traits will only be made available to farmers in countries where the necessary laws and regulations are in place and where the technology has been approved for commercialization by the relevant authorities.

As a company, Monsanto remains committed to broadly licensing our seed and trait technologies to other companies throughout the world. This approach ensures that farmers can access our products in the varieties that mean the most to their farm.

As would be expected in such a diversified marketplace, average prices paid by farmers per bag of seed vary enormously. Farmers may prefer the higher-value seeds but they still have a multitude of choices at many quality and price levels.

**With the regards to company participation in the agricultural sector, please take note that:**

Competition in agriculture is robust and billions are spent annually by various companies on research into new technologies, systems and hybrids. While Monsanto was one of the first companies to invest heavily in developing biotechnology trait technologies it was not the first nor is it the only company involved in developing trait technologies for farmers.

Farmers can choose from among hundreds of seed companies, hundreds of brands, and thousands of hybrids and varieties across Africa - each adapted to that particular country and its environment. This is also true for other parts in the world. These choices include seeds with individual traits developed through traditional breeding - so called conventional seeds, open pollinated seeds as well as biotech traits in countries where the technology has been approved.

The broad licensing strategy pursued by Monsanto and, to a lesser extent, by other companies with patented traits has facilitated competition and brought greater choice to the farmer.

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<sup>[i]</sup> 2050 – Africa’s food challenge, FAO press release, <http://www.fao.org/news/story/en/item/35770/icode/#>