

Genetically Modified Crops – Part of the Solution

There is no one solution to food security or food inflation; no silver bullet and no quick fix. An integrated approach to protecting the current food supply whilst investing in methodologies to increase agricultural productivity and reduce waste is the key to the future. Biotechnology, including GM, is part of this solution:

- ✓ By protecting yields and increasing productivity, GM can help to stabilise food supplies and reduce the rising prices of key commodities such as milk, meat and staple foods.
- ✓ GM can play a role in advancing developing nations' economic progress, by increasing yields of food crops such as maize and cash crops such as cotton.
- ✓ The application of agricultural biotechnology is already successfully reducing the environmental and carbon footprint of agriculture. There is potential for GM crops to offer a range of benefits over the longer term that could make an important contribution to the climate proofing of agriculture.

For the UK and Europe to benefit from the potential of the use of new technology:

- ❖ There must be no compromise on robust approval systems, but the current slowness of EU processes puts UK competitiveness at risk by disallowing imports and will allow food prices to continue to rise.
- ❖ There needs to be a comprehensive but coherent regulatory framework to maximize the potential of biotechnology and to avoid disruption of feed supplies.
- ❖ There must be a review of current regulations over the disclosure of crop trial location information which prevents important scientific research from progressing in the UK.

Stabilising food prices

- Changing diets, global urbanisation, economic growth and expanding populations are driving food and feed demand across the world, resulting in global price rises in key commodities such as meat, milk, bread and pasta. Globally, grain and feed remain the largest sources of demand growth in agriculture, stacked on top of which is now the fast growing demand for feedstock to fuel a growing bioenergy sector.
- Biotechnology, including GM, can play a key role in stabilising the food supply and fighting global food inflation by protecting and increasing yields of key animal feed crops (maize and soybeans) key to meeting the growing global demand for dairy and meat production.
- Public and private investments in agricultural innovation to increase agricultural productivity, particularly in developing countries, can help alleviate pressure on land and water resources, and

secure supply. The benefits brought about by this are widely distributed and impact most on farmers and consumers.

- Higher productivity in the big exporting countries essentially depresses the global market price. The large scale availability of GM soy from North and South America was successful in significantly offsetting the increased cost in animal feed post the bone meal / BSE era.¹

Distributing the benefits

- A recent Belgium study suggests that "...on average, two thirds of the global benefits are shared 'downstream', i.e., among domestic and foreign farmers and consumers, while only one third is extracted 'upstream', i.e., by gene developers and seed suppliers."²
- As Terri Raney, from FAO recently pointed out, "The economic evidence available to date does not support the widely held perception that transgenic crops benefit only large farms; on the contrary, the technology may be pro-poor. Nor does the available evidence support the fear that multinational biotechnology firms are capturing all of the economic value created by transgenic crops. On the contrary, the benefits are shared by consumers, technology suppliers and adopting farmers, although non-adopting farmers are penalised as their competitors achieve efficiency gains they are denied".

Increasing yields

- For over a decade, biotechnology has improved crop productivity by both protecting and increasing yields, particularly through virus and insect resistant plants. Genetically modified crops are already helping over 12 million farmers around the world by delivering more consistent yields of higher quality crops. The majority (>90%) of these farmers are resource-poor growers with small plots of land whose lives can be significantly improved through GM technology.³
- In 'area equivalents', if the GM technology used by farmers in 2006 had not been available, maintaining global production levels at the 2006 levels would have required additional plantings of 3.9 million ha of soybeans, 1 million ha of corn, 1.8 million ha of cotton and 0.15 million ha of canola.⁴
- Biotechnology helped increase U.S. crop yields by 8.34 billion pounds in 2005 — that's a yield increase for corn of 30% since 1996, and a 22% yield increase for soybeans over the last year.⁵ Biotech corn varieties have increased crop yields in South Africa and Argentina by 10% respectively. Farmers in China reported a 24% increase in cotton yields over 3 years, while farmers in the Philippines have reported an increase in maize yields up to 60%.⁶
- In all European countries growing Bt maize, yield gains were reported, ranging from 5-15% up to 25% in heavily infested regions. Significant yield gains were reported in the Spanish province of Zaragoza, with a yield increase of 1.11 kg/ha or 11.8%, leading, together with reduced pesticide costs, to an

¹ Ten Years of Genetically Modified Crops in Argentine Agriculture, Eduardo J. Trigo Eugenio J. Cap, December 2006

² GM Crops in Europe: How Much Value and for Whom? U Leuven

³ International Service for the Acquisition of Agri-biotech Applications (ISAAA)

⁴ G Brookes (2008) GM crops: Global socio-economic and environmental impacts 1996-2006

⁵ National Center for Food and Agricultural Policy (NCFAP).

⁶ International Service for the Acquisition of Agri-biotech Applications (ISAAA)

increased farmer income of up to € 120 per ha (this supports the findings of European project ECOGEN).

Advancing developing nations' economic progress

- The International Rice Research Institute (IRRI) has recently commenced developmental field trials in 2008 on vitamin A enriched 'Golden Rice'; 200g of this rice will give the RDA of vitamin A, potentially saving thousands of lives blighted by vitamin A deficiency.
- Public-private partnerships such as the CIMBAA⁷ project in India are effective means by which nutritionally important green crops such as cabbages resistant to the Diamond Back Moth caterpillar can be developed where normal business models would not justify their development. This project will be on the market with five years.
- Likewise with water-efficiency: the African Agricultural Technology Foundation (AATF), a public-private research partnership based in Nairobi is to develop, with research donated by Monsanto, "water-efficient maize" that will tolerate longer periods of drought, a trait that will become increasingly important if, as appears to be the case, climate change is making rains more variable. This will be marketable in five to six years.

Climate Proofing Agriculture

- Encouraging fuel-efficient agriculture: the introduction of GM canola in Canada has resulted in annual savings of over 30 million litres of fuel. Cumulatively, the numbers really start to stack up; since 1996, the growing of GM soybeans in Argentina has cut fuel use by a third (more than 1 billion litres worth) with a concomitant saving of 3 million tonnes of CO₂.
- Drought-tolerance: this is a trait usually associated with stress tolerance. Many companies including Bayer (oilseed rape) and Syngenta / Monsanto / Pioneer (maize) are field testing crops that are able to continue to yield under severe water stress; this is as relevant to farmers in East Anglia as it is in East Africa. Other crops such as rice and cassava are also being investigated.
- Nitrogen utilisation: Crops with various genetic modifications to improve their utilisation of the major nutrient, Nitrogen, from applied fertilizer or existing soil reserves, are already in early field trials research, for both maize and oilseed rape.

⁷ www.cimbaa.org

What would make a difference to realising the potential benefits?

1. Enabling Crop Trials in the UK

- Current UK Government legislation requires those conducting GM crop trials to release a six figure grid reference to disclose the exact location of the trial. This information has to be published in a national newspaper and is readily available on the Defra website.
 - Whilst the industry supports disclosure of information, this process is enabling anti groups to actively target those hosting the trials or in many cases attempt to destroy the trial site itself – seen most recently on 06 June in the vandalism of GM trials in Leeds. This makes the UK an unattractive place to conduct GM trials in terms of cost and risk to the project.
 - Many other European countries remain a more practical place to conduct trials. This is potentially putting the UK as risk of being left behind since it is critical to test specific GM traits in UK growing conditions.
- ❖ The Government could assess the effectiveness of the current regulations on disclosure and ensure illegal anti-GM activity is dealt with appropriately.

2. Speeding up the approval systems at an EU Level

- If traders in the EU livestock industry are reluctant to import feed from supplier countries such as US, Brazil, Argentina, where GM feed crop are now regularly produced, for fear that these do not have EU approval, there is a serious risk of negative impact on the livestock and associated industries.
 - This could impact on developing nations' adoption of GM if it impacts on their ability to access the EU market of conventional commodities.
 - There are current political attempts by some Member States to further disable the opportunities to realise the potential of this technology despite Europe already having the most robust approvals procedures anywhere in the world.
- ❖ The Government could use its influence at an EU level to carry the message that GM approvals need to be based case-by-case on sound science and counter further attempts by Member States to politicise the approval system, sending a clear message that the science is robust and that these should be adherence to the current regulatory system.

3. Managing consumer reaction

- There is clear evidence (Eurobarometer and the Food Standards Agency) that consumer concerns regarding the use of this technology are softening
 - The few GM products currently retailed in the UK are clearly labelled and are selling – these include vegetable oil and soya-containing processed food
 - The media is taking an active and well-balanced approach to the potential of new technology in agriculture
 - Industry is willing to defend the technology and make the case for its application, in conjunction with other stakeholders from the scientific, farming and industry community
- ❖ Whilst building on its recent supportive comments, the Government and groups such as the Food Standards Agency could publicly support the regulatory process in the UK and Europe as being robust, and thereby improve consumer confidence.