



Biotech Bulletin 16

A Decade of GM crops – Do they Deliver?

Welcome to this edition of Agrifood Awareness Australia Limited's (AFAA) Biotech Bulletin.

This year has seen the biotechnology agriculture industry celebrate a number of milestones. In May, the one billionth GM acre was planted somewhere in the world. This milestone comes ten years after the first commercial GM varieties of soybean, corn and cotton were planted in 1996. This equates to approximately 404.7 cumulative million hectares.

In Australia in November an event to celebrate the tenth anniversary of biotech crops (cotton and carnations) was held in the Darling Downs in Queensland. The Darling Downs was one of the first regions to adopt this technology, GM cotton, in Australia.

Coinciding with this event, AFAA recently had the opportunity to host Dr Clive James, the Chairman of the International Service of the Acquisition of Agri-biotech Applications (ISAAA) in Canberra for a day. Dr James was one of the key-note speakers at the Darling Downs event.

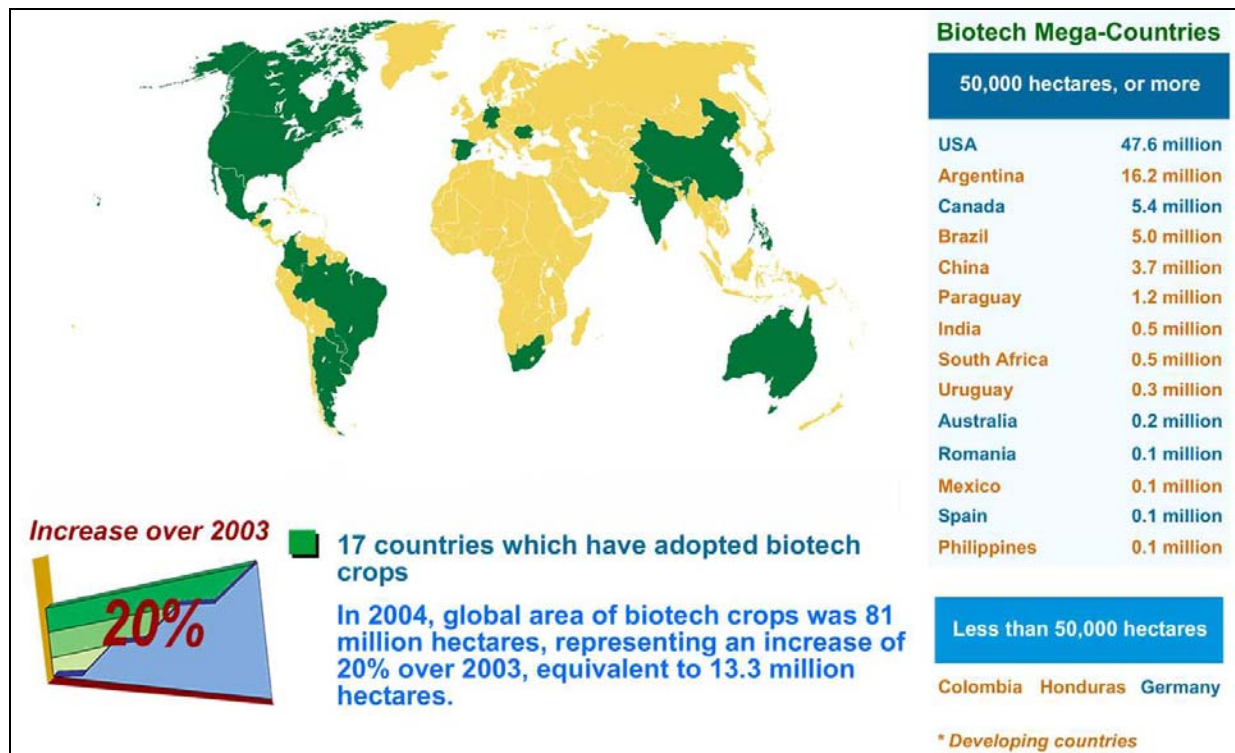
The ISAAA, founded in 1990 by Dr James, is a not-for profit charitable organisation, established to facilitate the acquisition and transfer of agricultural biotechnology applications from the industrial countries, for the benefit of resource-poor farmers in the developing world. The aim of the ISAAA is to alleviate hunger and poverty in the developing world.

According to Dr James, 'GM crops are being embraced in developing countries where there is greater interest in high-yield, and pesticide resistant crops that can sustainably increase productivity of food, feed and fibre crops'.

OVERVIEW

According to the ISAAA 2004 report entitled, *'Global Status of Commercialised Biotech/GM Crops: 2004'* genetically modified crops planted in 2004, increased by 20 per cent to reach 81 million hectares globally, an increase of 13.3 million hectares since 2003. This represents a 47-fold increase in hectares since the commercialisation of GM crops in 1996.

Over eight million farmers in 17 countries planted GM crops in 2004. This figure has increased from seven million farmers in 2003. Of the eight million farmers, 90 per cent or 7.5 million farmers are from developing countries.



ECONOMIC STUDY

During Dr James' recent Australian visit, he reported that the 'economic benefits to producers from biotech crops in the USA in 2003 were estimated at US\$1.9 billion while gains in Argentina for the 2001-02 season were US\$1.7 billion. China has projected potential gains of US\$5 billion in 2010, of which US\$1 billion will come from Bt cotton and US\$4 billion will be derived from Bt rice'.

A study released in October by Graham Brookes and Peter Barfoot, from PG Economics Ltd, entitled, '*GM Crops: The Global Economic and Environmental Impact – The First Nine Years 1996-2004*' presents the findings of research into the global economic and environmental impact of GM crops since their introduction.

The study found that there have been substantial net economic benefits at the farm level amounting to a cumulative total of US\$27 billion. In addition, the technology has reduced pesticide spraying by 172 million kilograms and has reduced the environmental impact associated with pesticide use by 14 per cent.

DEVELOPING COUNTRIES

According to the ISAAA, the number of developing countries (11) growing GM crops was almost double that of the number of industrial countries (six) in 2004.

Developing countries increased the growth of GM crops by 7.2 million hectares (35 per cent), recording the biggest gains, as opposed to 6.1 million hectares in industrial countries. India alone had the highest percentage growth in 2004 of Bt cotton, which was only introduced two years prior in that country, with an increase of 400 per cent.

There are five leading GM crop developing countries – Argentina, Brazil, China, India, and South Africa. These countries have a combined population of 2.6 billion people (40 per cent of the global population). Notably, these five countries grew 26 million hectares of the total GM crop area in 2004, this is equivalent to one third of the global total.

Dr James suggests that, 'of all the GM developing countries, China is likely to be the most influential in adopting GM crops, and what China is to Asia, Brazil is to Latin America and South Africa is to the continent of Africa.'

COUNTRY	2004 MILLION HECTARES	GM CROP	GLOBAL TOTAL (%)	2003 MILLION HECTARES
Argentina	16.2	Cotton, Maize, Soybean	20	13.9
Brazil	5.0	Soybean ¹	6	3.0
China	3.7	Cotton	5	2.8
India	0.5	Cotton ²	1	0.1
South Africa	0.5	Cotton, Maize, Soybean	1	0.4

SOURCE: ISAAA

¹ approved Roundup Ready soy in 2003

² adopted GM cotton (Bt) in 2002

ARGENTINA

For the 2004 planting season, Argentina was the second largest country or the first developing country growing GM crops with 16.2 million hectares. This was an increase of 2.3 million hectares from the previous 12 months. The USA continues to have the greatest area with 47.6 million hectares planted to GM crops.

BRAZIL

Since the approval of GM soybean in Brazil in 2003, plantings in 2004 continued to rise. In 2003, the first year of GM soybean, three million hectares were grown, however in 2004 the area increased by two-thirds to five million hectares. Brazil is the fourth largest country growing GM crops globally.

It is predicted that Brazil could potentially derive benefits valued at US\$1 billion/year from GM soybean, maize and cotton in the future. Dr James predicts that, 'Brazil is destined to be the number one GM developing country in the next three to five years.'

CHINA

China – the fifth largest country growing GM crops – increased its plantings of GM cotton in 2004 to 3.7 million hectares, an increase from 2.8 million hectares in 2003. According to Dr James, 'seven million small farmers, each farming one third of a hectare, benefited from growing GM cotton in 2004.'

Pest-resistant rice is expected to be approved in China in the near future – possibly as early as the next northern spring. The GM rice variety is expected to reduce pesticide use and lift yields. It is predicted that once GM rice is approved in China - one quarter of a billion people farm rice in China - and with the continuing plantings of GM cotton, China could potentially derive benefits valued at US\$5 billion by 2010 from its GM plantings. China alone is investing US\$200 million in GM crops.

Dr James predicts that China, during the second decade of GM crops, will have a much greater adoption rate of the technology and is certainly one country to watch.

INDIA

India the eighth largest country to grow GM crops in 2003, rose to seventh place in 2004. India is driven by the GM crop plantings occurring in China. Genetically modified cotton was introduced in India in 2002 and in 2004, 300,000 small farmers grew 500,000 hectares of the Bt cotton variety. The increase reported the highest percentage growth of GM crops in 2004, an increase of 400 per cent.

SOUTH AFRICA

In 2004, South Africa reported a 25 per cent increase in its combined area of GM maize, soybean and cotton to 0.5 million hectares, up from 0.4 million hectares in 2003. Strong growth continued in both white maize used for food and yellow maize used for animal feed. White maize plantings increased from 6,000 hectares in 2001 to 155,000 hectares in 2004. This is a 25-fold increase from when white maize was first introduced in 2001.

Genetically modified soybean plantings in South Africa have also increased from 35 per cent to 50 per cent in 2004. Bt cotton has stabilised at an adoption rate of approximately 85 per cent.

FUTURE PROJECTIONS

While in Canberra, Dr James posed the question, "Can 30 million farmers all be wrong in terms of the decision they made, over the last decade, in relation to this technology?".

Dr James predicts that, by 2010 there is likely to be more than 150 million hectares (375 million acres) of GM crops, with up to 15 million farmers planting GM crops in up to 30 countries.

The global number and proportion of small farmers from developing countries growing GM crops is expected to increase significantly in the future. With the second decade of global GM crops globally upon us, it is predicted that there will be considerable increases in the adoption rate of GM crops in Asia. Dr James believes that "the greatest pollutant we have in the world today is poverty".

Despite the continuing debate and challenges associated with GM crops, the area planted to GM crops and the number of farmers growing them has continued to grow at a double digit rate or more, since their introduction in 1996.

FOR MORE INFORMATION

FAO Biotechnologies in Developing Countries: www.fao.org/biotech/inventory_admin/dep/default.asp

ISAAA: www.isaaa.org. (NB: The 2005 global GM crop statistics will be released by ISAAA in early January 2006).

PG Economics Report: www.pgeconomics.co.uk/pdf/globalimpactstudyfinal.pdf

OF INTEREST

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