



Biotech Bulletin 17

Uptake of GM crops in 2005

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

INTRODUCTION

2005, ten years after the first commercial GM crops were planted, sees the continued growth of GM crops at a double-digit rate according to a report released yesterday by the **International Service for the Acquisition of Agri-biotech Applications (ISAAA)**.

In 2005, the global GM crop area continued to grow as the one billionth acre, equivalent to 400 million hectares, was planted. Genetically modified crops planted in 2005, increased by 11 per cent reaching 90 million hectares, an increase of nine million hectares since 2004. This increase represents a 50-fold increase in hectares since the first introduction of GM crops in 1996.

The report states that 8.5 million farmers in 21 countries planted GM crops in 2005. This figure has increased from 8.25 million farmers in 17 countries in 2004. Notably in 2005, four new countries grew GM crops compared with 2004, three being from the European Union (EU) - **Portugal, France, and the Czech Republic** - whilst the fourth was **Iran** growing GM rice for the first time.

The largest increase in GM crop area in any country in 2005 was Brazil, up by an estimated 4.4 million hectares (9.4 million hectares in 2005 compared with five million in 2004). India by far had the largest year-on-year proportional increase, with an almost three-fold increase from 500,000 hectares in 2004 to 1.3 million hectares in 2005.

This Biotech Bulletin explores the recent findings of the 2005 ISAAA report by Dr Clive James in some detail.

GLOBAL AREA OF GM CROPS

In 2005, the global area of GM crops continued to grow for the tenth consecutive year at a sustained growth rate of 11 per cent, compared with 20 per cent in 2004. As tabled below, 1.7 million hectares of GM crops were grown in 1996, increasing to 90 million in the ten years to 2005.

Global Area of GM Crops 1996 – 2005 (million hectares)									
1996	1.7	1998	27.8	2000	44.2	2002	58.7	2004	81.0
1997	11.0	1999	39.9	2001	52.6	2003	67.7	2005	90.0

PRINCIPAL COUNTRIES

The United States of America (USA), Argentina, Brazil, Canada and China continued to be leading growers of GM crops with Paraguay, India and South Africa now adding to this list.

	COUNTRY	HECTARES	GM CROPS	GLOBAL TOTAL (%)
1.	United States of America	49.8 million	Canola, Cotton, Maize, Soybean, Squash, Papaya	55
2.	Argentina	17.1 million	Cotton, Maize, Soybean	20
3.	Brazil	9.4 million	Soybean	10
4.	Canada	5.8 million	Canola, Maize, Soybean	6
5.	China	3.3 million	Cotton	4
6.	Paraguay	1.8 million	Soybean	2
7.	India	1.3 million	Cotton	2
8.	South Africa	0.5 million	Cotton, Maize, Soybean	1

Following these eight countries, the countries below planted 50,000 hectares or more to GM crops in 2005.

	COUNTRY	HECTARES	GM CROPS	GLOBAL TOTAL (%)
9.	Uruguay	0.3 million	Soybean, Maize	<1
10.	Australia	0.3 million	Cotton	<1
11.	Mexico	0.1 million	Cotton, Soybean	<1
12.	Romania	0.1 million	Soybean	<1
13.	Philippines	0.1 million	Maize	<1
14.	Spain	0.1 million	Maize	<1
15.	Colombia	<0.1 million	Cotton	<1
16.	Iran	<0.1 million	Rice	<1
17.	Honduras	<0.1 million	Maize	<1
18.	Portugal	<0.1 million	Maize	<1
19.	Germany	<0.1 million	Maize	<1
20.	France	<0.1 million	Maize	<1
21.	Czech Republic	<0.1 million	Maize	<1

Iran - officially released Bt rice in 2004 to coincide with the International Rice Year. In 2005, several hundred farmers grew an estimated four thousand hectares of Bt rice on their farms in initial commercialisation activities and to ensure provision of seed supplies for full commercialisation in 2006. Iran plans to deploy Bt rice on 10,000 to 20,000 hectares in 2006.

Iran is one of the largest importers of rice in the world, importing about one million tonnes per year, or more. The GM rice program in Iran is well advanced but is only one of several GM crop initiatives at 23 institutes, where researchers are working on several GM crops.

Two other GM crop field trials are currently underway in Iran - virus resistant sugar beet and herbicide tolerant canola.

Portugal – resumed planting Bt maize after a five-year gap. Portugal planted an introductory area of approximately 1,000 hectares in 1999 for one year. In 2005, approximately 750 hectares were planted to Bt maize. According to the report, as a member country of the EU, Portugal's resumption of the cultivation of Bt maize is an important development.

At present in Portugal other GM maize varieties are undergoing field trials - herbicide tolerant maize and herbicide tolerant and insect resistant maize.

France - resumed planting Bt maize in 2005 after a four year gap. France planted Bt maize in 1998, (1,500 hectares), 1999 (150 hectares), 2000 (<100 hectares). In 2005, approximately 500 hectares were planted of which 200 hectares were for environmental monitoring, 100 hectares for experimental use, and 200 hectares for commercial purposes.

France authorises a number of GM products for imports under the EU approval process, as an EU Member State. France imports large quantities of soybean meal and soybeans for crushing for their animal feed rations. In 2003/04, Brazil displaced the USA as the largest supplier of soybean in France.

Currently, there are a number of GM crop field trials taking place in France including maize, grape, poplar, tall fescue (grass), sugar beet and tobacco.

Czech Republic – approved the commercial production of a GM crop for the first time in 2005 and grew 150 hectares of Bt maize. According to the report, the Czech Republic is likely to increase its maize area in order to reduce the need for maize imports. In 1999, it imported 76,000 tonnes of maize, while in 2004, it only imported 10,000 tonnes. Over 90 per cent of the total imported maize into the Czech Republic comes from Slovakia.

DEVELOPING COUNTRIES

During the first decade of commercialised GM crops, the proportion of the global area grown by developing countries has increased every year. In 2005, the 21 countries that grew GM crops included 11 developing countries and 10 industrial countries. More than one-third (38 per cent), up from 34 per cent in 2004, of the global GM crop area in 2005, equivalent of 33.9 million hectares, was grown in developing countries.

The growth between 2004 and 2005 was substantially higher (6.3 million hectares or 23 per cent) than industrial countries (2.7 million hectares or five per cent).

According to the ISAAA report, the global area and number of farmers planting GM crops is expected to continue increasing in 2006 and beyond.

DOMINANT CROPS

Globally in 2005, growth continued in the four dominant commercialised GM crops (soybean, maize, cotton and canola). Genetically modified soybean continued to be the dominant GM crop in 2005, representing 60 per cent of the global GM crop area.

GM CROP	2002 (million hectares)	2003 (million hectares)	2004 (million hectares)	2005 (million hectares)
Soybean	36.5	41.4	48.4	54.4
Maize	15.4	15.5	19.3	21.2
Cotton	6.8	7.2	9.0	9.8
Canola	3.0	3.6	4.3	4.6
TOTAL	61.7	67.7	81.0	90.0

DOMINANT TRAITS

During the ten-year period, 1996 to 2005, herbicide tolerance has consistently been the dominant trait followed by insect resistance and stacked genes incorporating the two traits.

In 2005, herbicide tolerance, deployed in soybean, maize, canola and cotton occupied 71 per cent or 63.7 million hectares (up from 58.6 million hectares in 2004) of the total global GM area.

The second most dominant trait, insect resistance occupied 6.2 million hectares (18 per cent) and varieties with the stacked genes accounted for 10.1 million hectares (11 per cent).

GLOBAL VALUE

According to the report, in 2005 the global market value of GM crops was US\$5.25 billion having increased from approximately US\$4.70 billion in 2004 and US\$4.6 billion in 2003. The global value of the GM crop market is projected to reach more than US\$5.5 billion by 2006. The market value of the global GM crop market is based on the sale price of GM seed plus any technology fees that apply.

The accumulated global value for the ten-year period since 1996 is estimated at US\$29.2 billion.

FUTURE PROSPECTS

Dr Clive James the author of the ISAAA report believes that commercialised GM crops will continue to grow in the second decade 2006-2015, delivering significant economic, environmental, social and consumer benefits to both small and large farmers globally.

According to the report, the number of countries adopting the four dominant GM crops is expected to grow, and the global hectareage and number of farmers planting GM crops is expected to increase.

As the first generation of GM crops is more widely adopted and the second generation of new applications for both input and output traits becomes available, the global GM crop area is expected to increase. Dr James believes that input and output traits stacked to create value and meet the multiple needs of both consumers and producers, who seek more nutritional and healthier food and feed at the most affordable prices, in the near term will grow.

FURTHER INFORMATION

International Service for the Acquisition of Agri-biotech Applications (ISAAA) Briefs No.34-2005 www.isaaa.org. The ISAAA is a non-profit organisation which aims to deliver the benefits of biotechnology to the poor in developing countries.

We look forward to your feedback on this newsletter.

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