

INT - GLOBAL GM CROP ADOPTION CONTINUES TO CLIMB

The International Service for the Acquisition of Agri-Biotech Crops (ISAAA) has announced that the global uptake of GM crops had continued to increase in 2009.

2009 - Top 12 GM countries

Country	Area	GM crops
USA	64	Soybean, corn, cotton, canola, squash, papaya,
Brazil	21.4	Soybean, corn, cotton
Argentina	21.3	Soybean, corn, cotton
India	8.4	Cotton
Canada	8.2	Canola, corn, soybean, sugarbeet
China	3.7	Cotton, tomato, poplar, papaya, sweet pepper
Paraguay	2.2	Soybean
South Africa	2.1	Corn, soybean, cotton
Uruguay	0.8	Soybean, corn
Bolivia	0.8	Soybean
Philippines	0.5	Corn
Australia	0.2	Cotton, canola

In brief:

- In 2009, 134 million hectares of GM crops were planted around the world - representing an 80-fold increase between 1996 (when GM crops were first commercialised) and 2009.
- The number of farmers growing GM crops increased to 14 million - 13 million of which (or over 90 per cent) were based in developing countries.
- This GM crop adoption increase represents a nine million hectare or seven per cent per annum growth between 1996 and 2009.
- The number of countries planting GM crops remained the same as in 2008, at 25, with Costa Rica listed for the first time and Germany discontinuing planting of GM corn at the end of the 2008 season.
- As well those countries mentioned in the table above, Burkina Faso, Spain, Mexico, Chile, Colombia, Honduras, Czech Republic, Portugal, Romania, Poland, Costa Rica, Egypt, and Slovakia also grew GM crops in 2009.
- Fifty-seven countries have granted regulatory approvals for GM crops for import for food and feed use and release into the environment since 1996. A total of 762 approvals have been granted for 155 events in 24 crops; this includes a GM blue rose grown in Japan in 2009. Australia's national regulatory agency, the Office of the Gene Technology Regulator also approved the commercial cultivation of the GM blue rose in 2009. The GM rose, like the GM carnations grown in Australia and Colombia, is not included in the global hectareage statistics because it is not defined as a food, feed or fibre crop.

In terms of commodities, ISAAA reported that:

- More than three quarters (77 per cent) of the 90 million hectares of soybean grown globally were GM
- Almost half (49 per cent) of the cotton grown around the world was GM
- More than a quarter (26 per cent) of the 158 million hectares of corn grown globally was dedicated to GM varieties.
- 21 per cent of the 31 million hectares of canola were GM.

In relation to GM crop characteristics:

- Herbicide tolerance continued to be the dominant trait with GM herbicide tolerant soybean accounting for 69.2 million hectares or 52 per cent of the total 134 GM hectares, while herbicide tolerant corn occupied 41.7 million hectares, herbicide tolerant cotton occupied 16.1 million hectares and herbicide tolerant canola occupied 6.4 million hectares (up from 5.9 million hectares in 2008).
- Stacked trait crops (that is crops with a combination of more than one characteristic, for example herbicide tolerance and insect resistance) were planted in 11 countries, eight of which were developing countries.
- Forty-one per cent of the total 64 million hectares of GM crops planted in the USA in 2009 were stacked traits.
- In 2009, 85 per cent of the 35.2 million hectares of corn grown in the USA were GM and 75 per cent comprised of hybrids with either double- or triple-stacked traits – that is herbicide tolerance and insect resistance combined.
- In relation to cotton, 90 per cent of the area of cotton in the USA, Australia and South Africa was grown to GM varieties, with double-stacked traits occupying 75 per cent of the total area in the USA, 88 per cent in Australia and 75 per cent in South Africa.

Particular countries of interest:

- Brazil increased its GM crop plantings by 5.6 million hectares in 2009, with GM crops occupying 21.4 million hectares. Brazil now accounts for 16 per cent of all GM crops grown in the world
- In Africa in 2009, approximately 115,000 hectares (up from 8,500 hectares in 2008) of insect resistant GM cotton was planted in Burkina Faso, while Egypt planted approximately 1,000 hectares of GM corn
- In the European Union (a region often viewed as resistant to GM crops) six countries planted GM corn - Spain, Czech Republic, Portugal, Romania, Poland and Slovakia.

Of particular note, in Australia, GM canola uptake in NSW increased four-fold between 2008 and 2009 with 40,000 hectares successfully grown and handled through the supply chain in 2009. The GM canola area will continue to increase as 2010 will see Western Australia growers plant GM canola commercially for the first time.

GM rice

In November 2009, China issued biosafety certificates for its nationally-developed insect resistant (Bt) rice and phytase corn, clearing the way for crop registration, which will take 2 to 3 years before commercialisation. This is a significant development as rice is the most important food crop in the world, and according to ISAAA, it has the potential to directly benefit 110 million rice households in China alone, and 250 million rice households in Asia, equivalent to 1 billion potential beneficiaries.

Whilst rice is the most important food crop globally, corn is the most important feed crop. GM phytase corn will allow pigs to digest more phosphorous and coincidentally enhance their growth while reducing pollution from lower phosphate in animal waste. Given the increased demand for meat in a more prosperous China, phytase corn can provide improved animal feed for China's 500 million swine herd (half of the global swine

population) and its 13 billion chickens, ducks and poultry. Phytase maize has the potential to directly benefit 100 million maize households in China alone.

GM wheat: coming soon?

The ISAAA report includes a section about GM wheat and whether it is a reality in the near-term. It quotes Jeffrey Fox, who states that several developments in 2009 may point to progression of GM wheat in the marketplace, these developments are:

- Nine major wheat organisations in the USA, Canada and Australia pledged, “to work toward the goal of synchronised commercialisation of GM traits in our wheat crops.”
- Seventy-five per cent of USA wheat growers now approve of GM wheat, according to the National Association of Wheat Growers.
- Monsanto acquired the wheat operations of WestBred in 2009 indicating its intent to reengage in GM wheat, starting with conventional and marker-assisted breeding with GM wheat as a longer-term goal.
- Bayer CropScience announced a GM-wheat development alliance with CSIRO Australia to bring “solutions” to wheat growers as early as 2015
- On review of wheat GM wheat activities in China some observers concluded that China could be the first to commercialise GM wheat, possibly in 5 years time.

Some of the characteristics in the research pipeline for GM wheat varieties include resistance to yellow mosaic virus, head scab, powdery mildew, insect resistance, as well as drought and salinity tolerance, improved grain quality and herbicide tolerance. According to the report, China’s research into wheat varieties resistant to yellow mosaic virus is the most advanced globally, with commercialisation expected in five years.

Other Crops and Traits

Other crops expected to be approved before 2015 include potatoes with pest and/or disease resistance and modified quality for industrial use; sugarcane with quality and agronomic traits; disease resistant bananas; virus-resistant beans; and insect resistant eggplant.

Tomatoes, broccoli, cabbage and okra which require fewer insecticides, and crops developed specifically for developing countries such as cassava, sweet potato, pulses and groundnut are also candidates for gene technology research.

With all these developments in mind, ISAAA predicts the GM crop area will reach 200 million hectares by 2015, grown by 20 million farmers, or more, in 40 countries.

The full report can be viewed at:

www.isaaa.org/resources/publications/briefs/41/executivesummary/default.asp