

## **GM MAIZE IN SOUTH AFRICA PLANTED ON NEARLY 20 MILLION HA IN 16 YEARS**

*Presented by Andrew Bennett, technology development manager, Monsanto, for Africa and Asia, and chairman of the South African Agricultural Biotechnology Industry (ABI), at the annual ABI media conference in Pretoria on Tuesday 3 May 2016.*

The year 2015 marked the 20th anniversary (18 in South Africa) of the global production of GM crops (1996–2015). The first GM crop in South Africa, cotton, was planted in 1998. GM yellow maize followed in 2000, planted on only 3000 ha. From 2000 to 2015, in 16 years, nearly 20 million accumulated hectares of GM maize were grown in South Africa, yielding well over 50 million MT of grain.

Farmers' adoption of this new technology escalated at an unprecedented rate. GM maize peaked from an initial 3000 ha to a record 2.36 million ha in 2013. This makes biotechnology the fastest-growing crop technology in recent years. South Africa ranks ninth as a global GM crop producer.

In 2015, the worst drought in 35 years took its toll on biotech crops in South Africa. The biotech hectareage for all GM crops decreased by 700 000 ha (25%) from the intended 3 million ha to 2.3 million ha (2.7 million in 2014). GM maize was planted on 1.8 million ha at an adoption rate of 90% (2.14 million in 2014). White maize accounted for 1.03 million ha, 86% of the total white maize grown. Yellow maize at 0.96 million ha was 92% GM. GM soybeans at 95% adoption rate on 508 000 ha (552 000 in 2014). Biotech cotton 12 000 ha, 100% GM (8000 ha in 2014).

Economic gains for South African farmers from biotech crops 1998–2014 are estimated at US\$1.8 billion and US\$245 million in 2014 alone. (Brooks & Barfoot) Dryland yields of maize before the advent of GM averaged 1.5t/ha. Today average yields are 5t/ha for GM maize, an increase of 70%. GM maize under irrigation varies from 12t/ha to 20t/ha.

According to Mr Wandile Sihlobo, economist at Grain SA, in order to meet the shortfall due to the drought, South Africa is likely to spend between R13 billion and R14 billion between May this year and April 2017 to import 3.8 million tons of maize.

It is interesting to note how much more maize South Africa would have had to import were it not for the advent of the latest biotechnologies (GMOs) and modern maize germplasms.

The 1991/92 season was the last drought South Africa experienced before the adoption of GM crops. In that year the average maize yield was 0.85t/ha. The 2014/15 and 2015/16 seasons have both been drought years. With the adoption of GM maize the average yield today is estimated at 3.72t/ha.

If it were not for GM maize and our yield was still 0.85t/ha, we would have produced only 1.65 million tons of maize. To meet our local requirements we would have had

to import 9.4 million tons instead of 3.8 million tons, at an estimated additional cost of R33 billion.

The first WEMA (Water Efficient Maize for Africa) DROUGHT TEGO™ WE 3127 conventional white maize hybrid was launched by the Agricultural Research Council (ARC) in the 2014/15 season for planting by smallholder farmers in five provinces. In Limpopo, yields increased from an average of 0.6t/ha to 1.4t/ha. In North West, four smallholders increased their yields from 1.5t/ha to an average of 2t/ha. A biotech drought tolerant maize is expected to be launched in 2017.

Ms Topsy Ntseane, a smallholder farmer and president of AFASA for the Gauteng province, planted 40 ha of GM maize dryland and increased her yield from 2.3t/ha conventional to 7t/ha.

Researchers at Purdue University in the USA calculated what the world would look like if GM crops were removed from agriculture in the USA. Their conclusion was that maize yields could drop by 11.2% and soybean yields by 5.2%. More dramatically, cotton yields could drop by 18.6%. To fill these voids, 250 000 acres of US forests, pastures and 2.7 million acres globally would need to be converted into cropland. In addition, commodity prices would rise drastically – maize by 28% and soybeans by 22%.

## **AFRICA**

Adoption of GM crops in Africa is making good progress. Confined field testing of GM crops is currently under way in Burkina Faso, Cameroon, Egypt, Ghana, Malawi, Nigeria, Swaziland and Uganda. Biotech cotton is already successfully grown in Burkina Faso and Sudan. In 2015, Sudan increased its biotech cotton by 30% to 120 000 ha (90 000 ha in 2014). Egypt has also produced some GM maize in the past but is not planting at the moment.

The safety of GM crops, including food and feed derived therefrom, is underscored by the millions of farmers worldwide who have planted these crops continuously for 20 years. Not a single incident of adverse effects to humans, animals or the environment, anywhere in the world, has been recorded. Yet for the past 20 years anti-GMO activists continue claiming, without substantiated medical or scientific evidence, that GM crops are a threat to human and animal health and the environment.

One of the most critical campaigns, targeting glyphosate – the world's market leader herbicide for more than 40 years in 130 countries, claimed it to be "carcinogenic". However, the European Food Safety Authority (EFSA) rejected this claim outright, stating that "glyphosate is unlikely to pose a carcinogenic hazard to humans". Canada Health followed with a similar assurance "that glyphosate does not pose a health risk to farmers and other occupations that handle the product". Hundreds of scientific institutions globally concurred.

An outcry in the EU to ban the product was rebutted by the EU parliament on April 13, 2016, who voted that glyphosate should be authorised for the next seven years. Globally in 2012, glyphosate was used on 120 million ha of GM and non-GM crops.

## **LATIN AMERICA**

Ten countries in Latin America grew biotech crops. In 20 years, Argentina approved 20 GM crops.

## **EUROPEAN UNION**

Five EU countries planted 116 870 ha GM crops. Spain leads with 107 749 ha. Spanish farmers in 2012 reported an additional gross margin of €11 million for Bt maize. Nineteen of the 28 EU countries have banned GM crops. They do not plant it, but import more than 33 million tons of soybeans from the USA, Brazil and Argentina, 90% GM, used in 7000 food ingredients in addition to animal feed.

They are strongly food labelling minded. Ironically, 10 million tourists from the EU visit the USA annually, where 80% of the food is GM derived, but don't ask for labelled menus.

## **GLOBALLY**

Globally in 2015, some 18 million farmers in 28 countries planted 179.7 million ha of GM crops (181.5 million in 2014). The one percent decrease was due to droughts in various regions and that major biotech countries, including South Africa, have reached saturated adoption in most GM crops. However, strong growth is expected in developing countries. In 20 years globally, GM hectareage grew from 1.7 million ha in 1996 to 179.7 million in 2015. It is estimated that in the 28 countries farmers have benefitted by US\$150 billion from GM crops. (Brooks & Barfoot)

Several new approvals for GM crops were registered in the USA, mainly fruit, potatoes and alfalfa. The first GM animal was approved – a faster growing GM salmon. It is expected to enter the food chain in 2018. Atlantic salmon normally takes three years to harvest on fish farms compared to only 18 months, or half the time, for GM salmon.

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