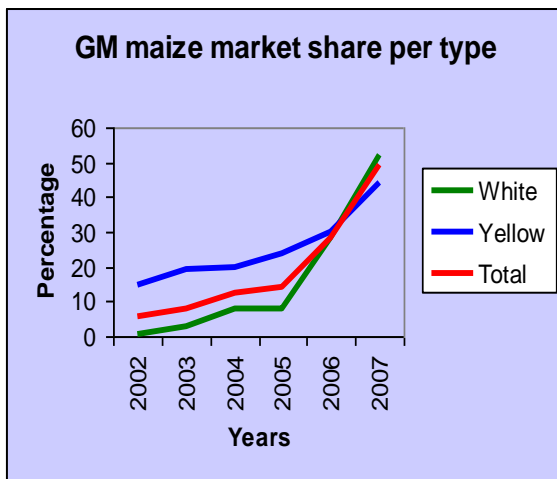
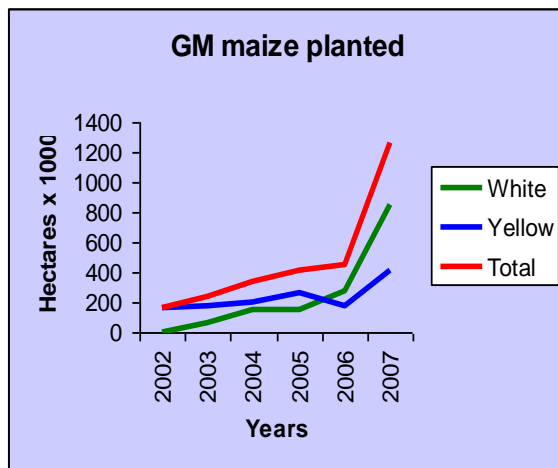


**FINAL REPORT ON THE AREA
PLANTED TO GM MAIZE IN SOUTH
AFRICA FOR THE 2006/2007 SEASON**



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EXECUTIVE SUMMARY

The study has a primary objective to survey and analyze GM (genetically modifies) maize production in order to serve as a database for parties trading in maize grain and products. Such information may be required for imports and exports, as well as serving local markets that may have special requirements. The survey is based on analyzing actual seed sales data provided on a confidential basis by seed companies, calculating the hectares planted according to seeding rates for different regions, and expressing GM areas in terms of percentages of total area planted as estimated by the Crop Estimates Committee.

GM maize has featured prominently in local and global media releases as result of its 180 per cent increase in hectares planted from 2005/6 to 2006/7. GM share of the maize market is now some 50 per cent, indicating its successful track record and adoption by maize producers. This increase resulted from both the rise in total hectares planted over 2005/6 and the increased market share that grew from 29 to 49 per cent. The biggest increase came from white maize that occupies 52 per cent of the white market. Yellow maize share increased from 30 to 44 per cent. Insect resistant Bt maize was the major trait accounting for 39 per cent of total maize planted, followed by herbicide tolerance that made up 10 per cent of the total. Approval has been granted for new maize hybrids that contain both traits and this will see a strong growth in the next few years.

White GM maize grew from 6 000 hectares in 2001/2 to 851 000 in 2006/7, while yellow maize increased from 160 000 hectares to 408 000 over the same period. The cumulative area planted to GM maize over the past six seasons came to 1.489 million hectares for white, 1.379 million for yellow, and 2.686 million combined. Users of GM maize seed include large-scale and small-scale commercial producers, as well as subsistence farmers. These users are from all maize growing regions.

Official 2006 statistics of permits granted for import of commodity grain that is or may contain GM, amounted to 121 shipments that totaled 1 261 metric tons. All such grain imports came from Argentina. More than 1 000 metric tons of GM hybrid seed for planting were exported.

1. INTRODUCTION

The objective of the study is to survey and analyze adoption of genetically modified (GM) maize by producers in South Africa in order to establish an updated database on GM plantings, available to maize industry stakeholders as a source of information. This would preclude confusion that may result from conflicting data being distributed by various parties as data in this report are based on reliable confidential statistics provided by biotechnology seed companies. It would also enable traders in maize grain and products to convey information to trading partners as may be required by customers domestically and in other countries, and to comply with the Cartagena Protocol on Biosafety.

The report includes hectares of GM maize planted and as percentage of market with a breakdown per trait-- insect resistant (IR) or herbicide tolerant (HT)-- shown separately for white and yellow maize, as well as historic data since 2001/2002 in order to highlight trends. An analysis of permits granted during 2006 is also included here as maize imports and exports of grain that are GM or may contain material of GM origin have trade relevance for the industry. Statistics are based on commercial maize plantings only as official data on subsistence farming are at best unreliable guesstimates and as most planting is based on farm-saved seed and the crops are consumed on-farm. Some information is included on sale of GM maize seed to the subsistence sector.

2. METHODOLOGY AND APPROACH USED IN SURVEY

The first estimate of genetically modified maize (GM) plantings is based on discussions and meetings with seed companies (Pannar, Pioneer, Monsanto, Link Seed, Syngenta, and Afgri) that are marketing GM maize seeds. The total maize area planted (2.552 million hectares) is based on the most recent

Crop Estimates Committee report available at the time of drafting of this final report.

The first estimate (November 2006) was based on intention to plant GM maize as reflected by anticipated seed sales, measured against the Crop Estimates Committee estimate resulting from surveys of intention by farmers to plant maize.

The final estimate proceeded by way of obtaining confidential company information on actual sales, as reconciled at end of the financial year (February) and provided by late March. This information is broken down between white and yellow maize, and per GM trait: Bt insect resistance (IR) and herbicide tolerance (HT). These sales data are converted, in association with key company officials, to hectares by a breakdown of sales per planting region according to planting density. Seed companies in recent years sell seed by seed count and not weight. Nevertheless, the guidelines used are seeding rates in kg/ha, taking into account the seed count per kg. Seeding rates of 25 kg/ha are used for irrigation production, 11-12 kg/ ha for the Eastern Highveld and KwaZulu-Natal, and 6-8 kg/ha for the Free State, North-West and Northern Province. A 25 kg pocket on average contains some 80 000 seeds. The surface areas planted are expressed as percentages of the total area, as estimated in the latest Crop Estimate Committee report (25 April 2007). FoodNCropBio as consultancy, also uses other means to verify the accuracy of data obtained and analyses conducted, and, therefore, the information contained in this report can be regarded as the best estimates available on GM maize.

No information is available per official maize growing region as seed companies mostly use their own defined regions and as buyers may have more than one farm in different regions. Provision of seed samples and sales to small-scale and subsistence farmers still make up a minor proportion of their maize production and no breakdown of area planted was available. Government statistics on subsistence farming are not reliable. Seed companies make no distinction between black and white commercial farmers in their records.

3. CHANGES IN REGULATORY SYSTEM

The GMO Act 15 of 1997 has been amended as follows:

- improved wording in several definitions,**
- addition of the Department of Art & Culture and the Department of Water Affairs & Forestry in the composition of the Executive Council,**

- including a qualification of two members of the Advisory Committee; one to have competence on ecological matters, and one on human and animal health,
- including wording required to ensure compliance with the Cartagena Protocol on Biosafety,
- inserting more details pertaining to environmental safety, and
- some general improvements of texts.

The GMO Amendment Bill had been approved in the middle of 2006 but signing by the President has not been formally conveyed to the GMO Secretariat to date, rendering the amended Act not yet official. The Department of the Environment & Tourism in Article 78 of the Biodiversity Act makes provision that the Minister may deny a GM permit unless an environmental impact assessment has been completed, and the Minister has to convey such a position to the GMO Executive Council for ratification.

Requirements developed under chairmanship of Standards South Africa (formerly SABS), have been approved for identity preservation (IP) of non-GMO and GM from seed to grain to ensure products meeting market requirements set by certain customers, but formal approval is still awaited for IP for foods and for diagnostics to detect GM presence.

The GMO Executive Council, as decision making body for the Minister, has delayed decision on import of maize grain that contains genetic modifications not yet approved in South Africa and that may not have potential benefit for farmers, specifically the “Bt corn root worm resistance”. The Council has also decided to study implications of “stacked gene” modifications although they did approve the combined Bt/herbicide tolerance genes for maize in February 2007. This approach may impact on approval of future gene combinations or import thereof, considering that stacked genes are a global trend.

4. RESULTS

Globally, adoption of GM crops increased by 12 million hectares or 13 per cent, to reach a total of 102 million hectares. GM Maize constitutes 17 per cent of the global 148 million hectares maize planted. South Africa ranks 8 th in the world on GM area planted and second in terms of percentage increase from 2005 to 2006. The 180 per cent increase was mainly due to maize area increasing from 1.6 to 2.552 million hectares, and to increased GM market share from 29 to 49 per cent of the market.

In South Africa, the insect resistance Bt trait had been approved for commercial release in 1998 and the herbicide tolerant trait subsequently. Sometimes delayed adoption of such traits is due to having the beneficial genes in the appropriate hybrid adapted to South African conditions and to

bulking up of seed. The impact of the stacked genes for insect resistance and herbicide tolerance will only become visible as from 2009 when seed production is sufficient to replace single gene hybrids. This impact is expected to be substantial.

It has already become evident that GM maize will be the mainstream product and conventional and organic production a secondary segment. GM maize for the 2006/7 season stands at 49.3 per cent of the total, comprising 52.3 per cent for white and 44.0 per cent for yellow. The major trait is Bt insect resistance being 38.8 per cent of total maize, and herbicide tolerance being 10.5 per cent.

Cumulatively, some 2.868 million hectares of GM maize have been planted over the past six seasons, constituting 1.489 million white and 1.379 million yellow.

The number of producers that plant GM maize is difficult to establish but it can be assumed that at least half of commercial maize producers use GM maize. Biotech seed companies do not indicate whether small-scale commercial farmers are white or black as most sales are handled through distributors. One company did indicate that they work with some 35 commercial farmers in North-West province growing an average of 50 hectares of maize each, and who use GM seed. They also sold small packs of GM maize seed to subsistence farmers, mostly in KwaZulu–Natal and Eastern Cape. The number of these farmers comes to about 4 500 and involves almost 2 000 hectares.

The summarized data are shown in the graph on the cover page, and detailed analyses hereunder.

Area planted to GM white maize *

2002: 6 000 ha out of 1.7 mil. ha. = 0.4% of white maize area (all IR)

2003: 60 000 ha out of 2.1 mil.ha. = 2.9% (all IR)

2004: 144 000 ha out of 1.8 mil.ha = 8.0% (all IR, HT negligible)

2005: 147 000 ha out of 1.8 mil.ha = 8.2% (142 000 IR = 7.9% + 5 000 HT = 0.3%)

2006: 281 000 ha out of 1.0 mil.ha = 28.8% (221 000 IR = 22.8% + 60 000 HT = 6.0%)

2007: 851 000 ha out of 1.625 mil. ha = 52.3% (552 000 IR = 34.7% + 152 000 HT = 9.6%)

Cumulative area planted to GM white maize over six years = 1.489 mill ha

Area planted to GM yellow maize *

2002: 160 000 ha out of 1.1 mil.ha = 14.5% of yellow maize area (all IR)
2003: 176 000 ha out of 0.9 mil.ha = 19.5% (all IR)
2004: 197 000 ha out of 1.0 mil.ha = 19.7% (all IR, negligible HT)
2005: 263 000ha out of 1.1 mil.ha = 23.9% (249 000 IR= 22.6% + 14 000 HT = 1.3%)
2006: 175 000 ha out of 0.6 mil.ha = 29.0% (107 000 IR= 17.8% + 68 000 HT = 11.3%)
2007: 408 000 ha out of 0.927 mil.ha = 44.0% (391 000 IR= 35.5% + 137 000 HT = 12.5%)

Cumulative GM yellow maize area over six years = 1.379 mil.ha

Total GM maize area planted over six years *

2002: 166 000 ha
2003: 236 000 ha
2004: 341 000 ha
2005: 410 000 ha
2006: 456 000 ha
2007: 1.259 mil. ha (out of 2.552 mil.ha = 49.3% (990 000 IR = 38.8% + 269 000 HT = 10.5%)

Cumulative GM maize area planted over six years = 2.868 mil.ha.

* Explanatory note:

IR = Insect resistance against stalk borers and ear borers using an inserted bacterial gene, the Bt protein toxin having been used as a spray-on bio-insecticide since about 1960.

HT = Herbicide tolerance to glyphosate/glyphosinate

5. MEDIA RELEASES

No separate media distribution of the results of this survey has been done. However, the brief review of GM crops in South Africa had been incorporated in the 2006 global crop report that was released internationally by ISAAA (the International Service for the Acquisition of Ag-biotech Applications). Maize featured prominently in this report and in media coverage. The key data were also submitted upon request, to Ms Joanna Lynecki of the Department of Agriculture for inclusion in her annual report to the International Grains Council.

The local 23 January 2007 media conference where details of the global and South African GM crop status were released, was highly successful in that key aspects were covered in live TV interviews and news broadcasts, radio interviews and news broadcasts, and in printed media news, as well as requests for articles on crop biotech in general. The President of AgriSA was guest speaker at this event. Copies of these articles can be supplied upon request.

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ANNEX

PERMITS ISSUED FOR IMPORT AND EXPORT OF GM MAIZE (January 2006 to December 2006)

The following is a synopsis of permits issued by the Registrar of GMOs upon directive from the GMO Executive Council in accordance with prescribed procedures under GMO legislation (Act 15/1997):

1. **TOTAL: 296 Permits for all genetically modified organisms (GMOs) issued for the calendar year 2006**
2. **MAIZE: COMMODITY IMPORT CLEARANCE:** A total of 121 permits were granted for importation of shipments that are or may contain GM. All grain imports were from Argentina. Shipments varied from 150 to 60 000 MT (metric tons), with an average of 10 420 MT. Total volume imported came to 1.261 million MT with an estimated commercial value ZAR 1.26 billion at ZAR1000 per ton.
3. **MAIZE: SEED IMPORTED FOR PLANTING = smaller volumes mostly from USA, intended for seed multiplication, field testing, breeding, or seed production. Permits issued numbered 66 and total volume amounted to 18 MT.**
4. **MAIZE: SEED IMPORTED FOR CONTAINED USE = for use in a physical contained structure such as lab or greenhouse as per definition in the GMO Act. Three permits were issued for a volume amounting to 4.02 MT (one permit of 4 MT is considered as mis-labelled, thus there**

should be two permits issued for 200 kg. This is being verified with Registrar).

5. **MAIZE: COMMODITY EXPORTS = NIL ***
6. **MAIZE: SEED EXPORTED FOR CONTAINED USE =** for use in contained structures but may include isolated field trials as the definition is not the same in all countries. Permits issued numbered 27 for a total of 518 kg; three to France, one to Germany and the rest to USA (the latter is assumed for backcrossing and multiplication of seed in isolated plots).
7. **MAIZE: SEED EXPORTED FOR PLANTING =** these are larger volumes for test marketing and commercial sale. Twelve permits were issued for a total volume of 1 232 MT, almost all to Asia, at an estimated commercial value ZAR 37 million.

*** Explanatory note: Re-export of imported grain that is or may contain GM grain falls under procedures regulated in terms of the GMO Act but is not shown in the permit system. This procedure is based on the SADC policy where such GM grain destined for neighbouring countries may need to be milled before shipping. Prior approval of the importing country for export of live grain is also required in terms of the Cartagena Protocol on Biosafety. Milled grain is then classified as a beneficiated product and not a live product. Data on such re-exports will be obtained from the Department of Agriculture in due course.**

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