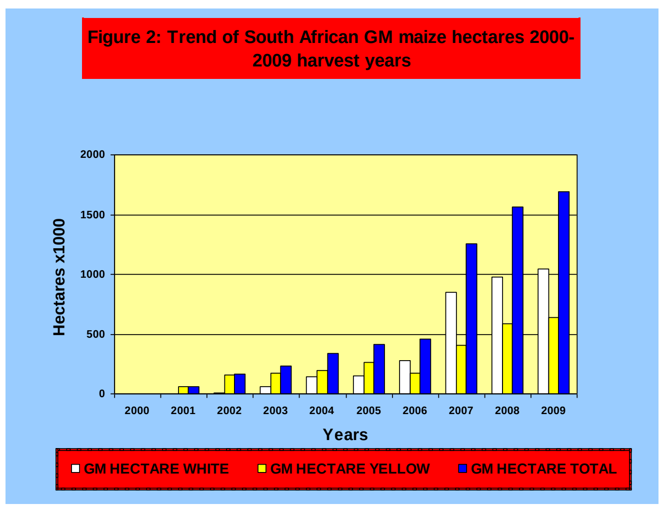
FINAL REPORT ON THE ADOPTION OF GM MAIZE IN SOUTH AFRICA FOR THE 2008/2009 SEASON



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EXECUTIVE SUMMARY

The study has a primary objective surveying and analyzing GM (genetically modified) maize production that can serve as a database for stakeholders ranging from seed suppliers to producers, silo owners, grain traders, millers, food industry, consumers, and government departments. An updated overview is presented on relevant regulatory developments and analysis of permits granted. 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 collating and 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. It covers analyses by GM trait separately for white and yellow maize.

Global GM crop plantings increased by 9.4% to reach 125 million hectares, grown by 13.3 million farmers in 25 countries. The cumulative hectares under GM crops over 12 years stand at 800 million hectares, double the cumulative area up to 2005. Global GM maize planting covers 37.3 million hectares in 17 countries and represents 24% of all maize produced. The strongest growth in the US came from stacked traits.

South Africa still ranks 8th in the world with 1.8 million hectares combined of the three crops: maize, soybeans and cotton, and producers have 93 GM maize hybrids to chose from. Total GM maize planted came to 1.688 million hectares, 1.046 million white and 0.642 million yellow, with share of the total planting at 69% for total maize, 70% for white and 68% for yellow. GM maize area increased by 8% over 2007/8 despite the national maize area declining by 12%. Insect resistance trait declined from 71% to 61% of total GM, herbicide tolerance from 24% to 19%, while stacked traits' share increased from 5% to 20%. Cumulatively, total GM maize area from 2000 to 2009 harvest covered 8.9

million hectares and produced a grain yield of over 23 million MT,

GM adoption by market share and by traits was about the same for white and yellow maize. Although there are pockets of non-GM production, for all practical purposes all regions grow GM maize. A rough estimate indicated that about 4 000 – 5 000 commercial farmers plant GM maize. Partial information was obtained on emergent and commercial black farmers growing GM maize and this covered some 37 000 hectares involving Bt, herbicide tolerant and stacked traits. Less information was available on household and subsistence planting. The some 13 000 GM maize hectares in one analysis included both traits and stacked genes.

Field trials are ongoing with drought tolerance and new stacked gene combinations. Investigations on occurrence of tolerance or resistance in stalk borers to the Bt gene are being continued.

Various GMO regulatory developments may have some to major impact on stakeholders. Updated regulations under the GMO amended act are near completion. The S A Bureau of Standards is drafting standards for managing GMOs with GM commodity grain as focal point. It is not clear how the GMO Executive Council will implement the brief draft policy on biosafety assessment of stacked genes. Biosafety SA, a separate body under PlantBio, is addressing impact on biodiversity. The Consumer Protection Act developed by Department of Trade & Industry contains a provision for mandatory labeling of GM ingredients, and this clause was pushed through in spite of objections from many parties in the food production, agri-business and retail sectors. New fees were published for application for permits, and a new requirement set for GM lab testing of grain consignments for export.

Analysis of permits approved during 2008 for GMOs showed that maize permits accounted for 84% of the 272 issued. GM grain imports numbered 29 permits with a total of 226 000 MT, significantly down from 2007. For the first time maize grain were

exported under GMO permits. GM seed imports increased from 1196 MT in 2007 to 5581 and exports increased from 1509 to 3430 MT. Other GM seed imports and exports were for trials, seed multiplication or contained use evaluation.

A media conference on GM crop adoption globally and in South Africa received wide coverage locally and internationally.

Finally, extensive production of GM maize has taken place over the past ten years without any substantiated incidents of damage to human or animal health, or to the environment. This is evidence of a biosafety framework that helps to ensure assessment of safety of GM products prior to approval for commercial release, and compliance by biotech stakeholders with regulations. The real risk that is now emerging, is the trend towards extensive regulatory systems that may put local GM innovation beyond the financial reach of academic, public and private research institutions.

1. INTRODUCTION

The objective of the study was 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. 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.

Beneficiaries of this information include the following parties and their clients or colleagues:

AgriSA, GrainSA, grain traders, millers, silo industry, industrial processors, food and animal feed manufacturers and their clients, seed industry, CEC, SAGIS, SAGL, National Department of Agriculture, ARC, the GMO Secretariat, Executive Council, Advisory Committee, and the media.

Data in this report are based on reliable confidential statistics provided by biotechnology seed companies and cover hectares of GM maize planted and percentage of market with a breakdown per trait -- insect resistant (IR) or herbicide tolerant (HT) and stacked genes (IR/HR) -- shown separately for white and yellow maize, as well as historic data since year 2000 in order to highlight trends. An analysis of permits granted during 2007 is also included as maize seed and grain imports and exports that are GM or may contain material of GM origin have trade relevance for the industry. Statistics are based on commercial maize plantings as official data on subsistence farming are at best unreliable guesstimates. However, some very useful information was obtained from three collaborating parties and this analysis is contained in the results.

2. METHODOLOGY AND APPROACH USED IN SURVEY

The survey goes through two stages so that information is refined with latest information available at each stage. Seed companies provide a breakdown of seed sales per GM trait (Bt insect resistance, glyphosate herbicide tolerance, and stacked genes for both traits), per white and yellow maize, and per seed density used (6-8 kg/ha for drier Western and Northern regions, 10-12 kg/ha for Eastern and South-Eastern regions, and 20-25 kg/ha for irrigation farming. Seed is mostly sold on seed count basis in pockets containing 60 000 or 80 000 seeds and, in fact, seed count gives a more accurate picture of area planted to a pocket than mass as an average rate of 10 kg/ha may involve 25 000 to 35 000 seeds, depending upon seed size and shape.

It was not possible to survey areas planted to GM maize per CEC region as each seed company has its own sales regions based on its analysis of agro-ecological parameters and its marketing infrastructure, and they do not record sales per CEC provincial regions.

The *first estimate* in October 2008 of GM maize plantings was based on discussions and meetings with six seed companies (Pannar, Pioneer, Monsanto, Link Seed, Syngenta, Agricol, and Afgri) that are marketing GM maize seeds. The total maize area planted (2.6 million hectares) was derived from an average of expectations expressed by seed companies from seed orders and, fortuitously, matched the first CEC estimate in February 2009. The latter subsequently declined to 2.457million ha in June.

The *second estimate* derived in May-June 2009 made use of confidential company audited seed sales information, broken down by yellow and white, by plant density scenarios and by trait, while the latest CEC area estimate in June was used to calculate GM share. Personal discussions were also held with each seed company individually during the Nampo annual show in May, so as to obtain unanimity on the basic approaches used to derive areas planted and to test their personal perceptions on GM maize adoption.

It was more difficult to obtain data on smallholder/emergent farmer use of GM maize but partial information was supplied by three companies.

This report extends to an overview on regulatory developments based on my interaction with officials and private parties, and information on the Department of Agricultural's website. This also covered some aspects of testing for GM presence in grain.

3. RESULTS

3.1 Maize technologies and yields

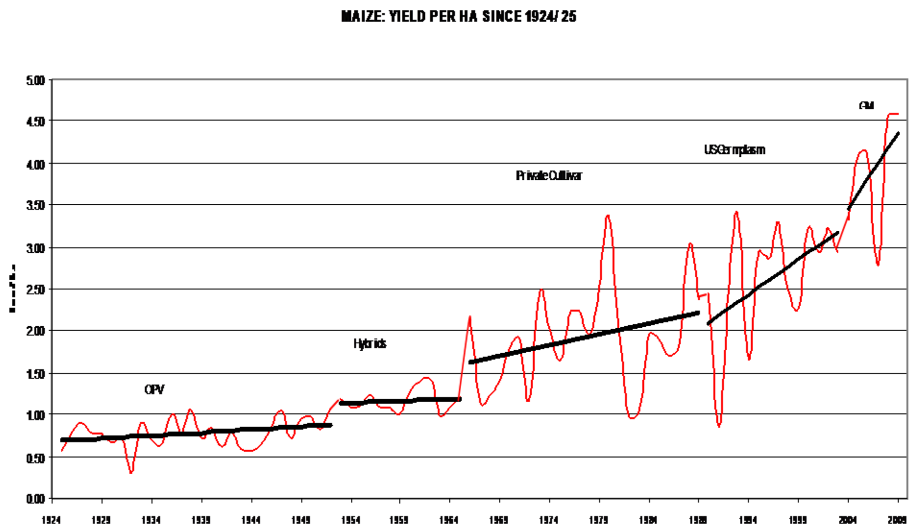
Maize producers, like in most other agricultural sectors, have survived the ravages of a fickle climate, variable soils, politics, and an uneven international trade playing field, by continuously improving their efficiency, supported by new technologies. It is also such advances that have enabled the American maize farmer to achieve a national average yield of 10 MT per hectare. Maize genetics constitutes one of these technologies. A study conducted in the 1980s by Gevers and Kühn showed in extensive national variety trials that hybrids of that time, compared with hybrids of the 1960s, were responsible for 36% of yield gains, the balance coming from improved farming systems, fertilizers and pest control management. This represented 1.2% genetic gain per year, comparable at that stage to gains in the US.

An attempt has been made to break down the 84-year South African historic yield data into eras of genetic advances in maize breeding. It is accepted that the timelines here are somewhat arbitrary as progression is mostly not leapfrogging but continuous and that the move to more precision farming, reduction in use of marginal land, other systems and other inputs, and rainfall also contribute significantly. In fact, so does the increase of maize under irrigation where yields of over 15 MT/ha have been obtained. However, the present high yield potential levels would not have been realized without improved maize genetics.

The breakdown graph in Table1 below is intended to indicate that high yields over the last four years can be attributed also to potential of GM packed into enhanced genetic backgrounds.

FIGURE 1.

NATIONAL MAIZE CROP YIELDS PER HECTARE 1924 TO 2009 FOR FIVE PERIODS: OPVs, ADVENT OF HYBRIDS, PRIVATE HYBRIDS, INFUSION OF US GERMPLASM, AND IMPACT OF GM



3.2 Global overview

Annual overviews are compiled by ISAAA (the International Service for the Acquisition of Agri-Biotech Applications), an international non-profit organization. These overviews are released by way of international media conferences and published as Briefs. Other updates are printed in the form of small brochures and updates provided in the form of a weekly e-newsletter. Surveys and studies are executed by independent groups in various countries. Salient points from the 2008 Brief 37 (C. James, 2008, "Brief 39: Global Status of Commercialized Biotech/GM Crops: 2008", and available in executive summary format on www.isaaa.org) are as follows:

- **Global planting of GM crops increased by 9.4% to reach 125 million ha in 2008.**
- **These crops were planted by 13.3 million farmers in 25 countries, 12.3 million being smallholder farmers.**
- **Cumulative area under GM crops since 1996 now amounts to 800 million ha, double the 2005 cumulative area.**
- **For 2007, the USA leads with 62.5 million ha, followed by Argentina 21, Brazil 15.8, India 7.6, Canada 7.6, China 3.8, Paraguay 2.7, and South Africa with 1.8 million ha. The remaining 17 countries (in order of areas) are Uruguay, Bolivia, Philippines, Australia, Mexico, Spain, Chile, Colombia, Honduras, Burkina Faso, Czech Republic, Romania, Portugal, Germany, Poland, Slovakia, and Poland.**
- **In addition to the 25 countries growing GM crops, another 30 have approved biotech crops for import as food and feed, and /or for trial planting. These 670 approvals involve 144 genetic modifications in 24 crops.**
- **Soybean remains the major GM crop (65.8 million ha), followed by maize (37.3 million ha), cotton (15.5 million ha) and canola (5.9 million ha).**
- **The major trait is herbicide tolerance at 63% share of total GM 79 million ha, followed by double and triple stacked traits at 22% or 26.9 million ha, and insect resistance at 15% or 19.1 million ha.**
- **Cumulative farmer benefits for 1996 -2007 were US$44 billion, and pesticide savings amounted to 359 000 MT active ingredients.**
- **Most growth in adoption now comes from developing countries, driven by Bt cotton in China and India, and soybeans in Brazil.**

GM maize global production on 37.3 million ha takes place in the US, Argentina, Brazil, Canada, South Africa, Uruguay, Philippines, Spain, Chile, Honduras, Czech, Romania, Portugal, Germany, Poland, Slovakia, and Egypt (in declining order of area planted). Egypt's entry into growing Bt maize is based on cooperation with South Africa and joint development of the GM hybrid. Farmer income benefits from 1996-2007 have been

calculated at US$7 billion of which $2.4 was in 2007 (Barfoot & Brooks, 2009). The trait share of US maize grown on 35.3million ha is 22% single traits, 30% double stacked traits, and 48% triple stacked traits.

The global area of 37.3 million ha planted to GM maize in 2008 represents 24% of the world maize planting of 157 million ha.

The global trends are shown on next page (p.12) in Figure 2 and Figure 3.

3.3 South African overview, results and discussion

The final estimate of genetically modified maize (GM) plantings was based on discussions and meetings with seed company representatives (Afgri, Agricol, Klein Karoo Saad, Linkseed, Monsanto, Pannar, Pioneer, and Syngenta) that are marketing GM maize seeds and/or GM technology. Klein Karoo Saad (K2 Saad trade name) is in the process of taking over the seed operation of Afgri and was not yet in a position during 2008 to market GM maize seed. The total maize area planted (2.457 million hectares) is based on the most recent Crop Estimates Committee report (June 2009) available at the time of drafting of this final report.

3.3.1 Genetic modifications (events)

South Africa retained its 8th ranking on the ISAAA list of biotech crop countries with 1.8 million ha planted in 2007. Genetic modifications approved for commercial release are (cont. p13):

FIGURE 2

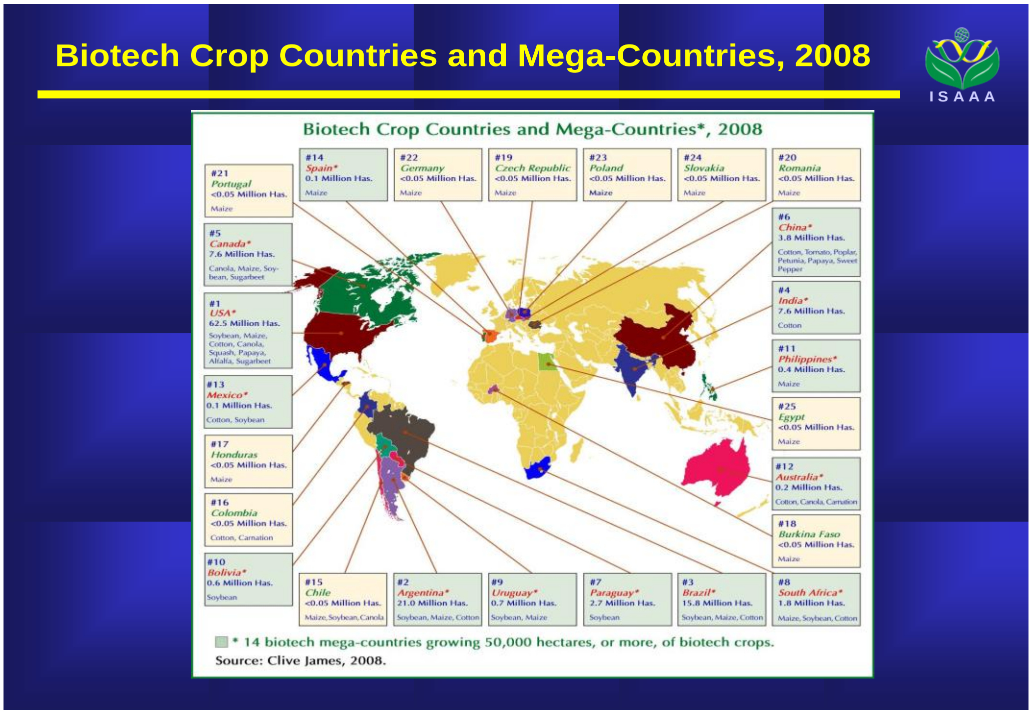
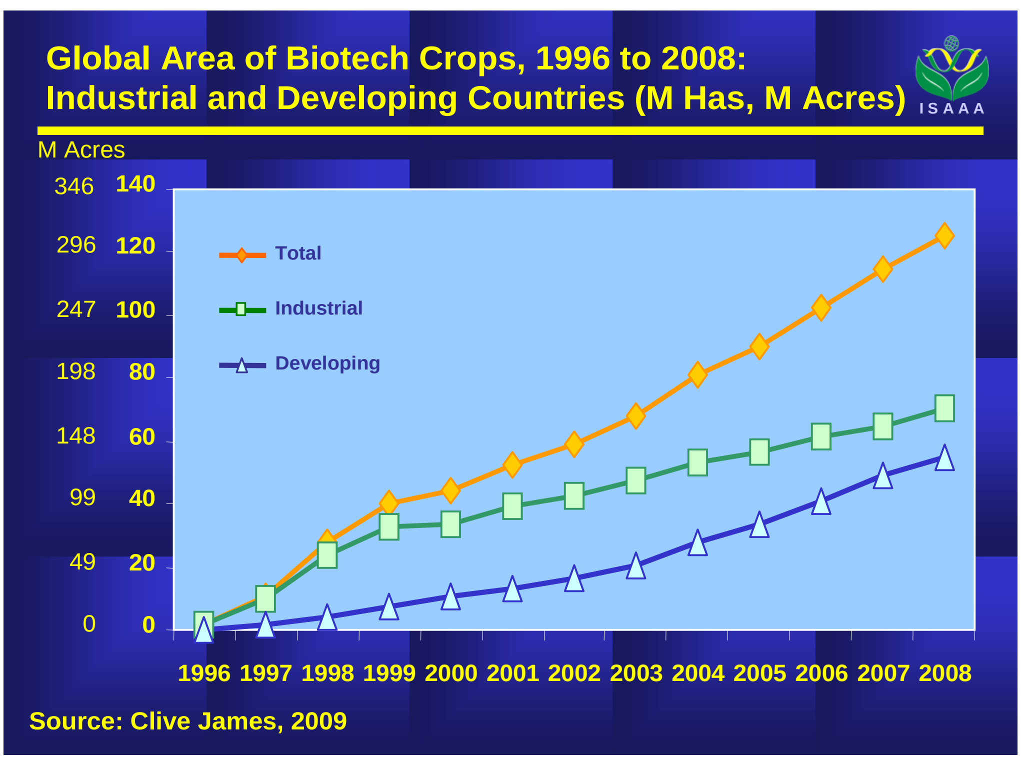


FIGURE 3



1997/8: Bt insect resistance Mon 810, Monsanto

- **2002: RR glyphosate tolerance NK 603, Monsanto**
- **2003: Bt 11 insect resistance + herbicide tolerance, Syngenta**
- **2007: Bt insect resistance + glyphosate tolerance, Mon810 x NK603, Monsanto.**
- **2007: Bt insect resistance + herbicide tolerance, MON 00603-6 x MON 00810-6**

3.3.2 GM hybrids

Entries of GM maize hybrids on the official 2008 variety list are as follows:

The official list contains the designations of 242 white cultivars, 192 being hybrids, 34 open-pollinated, 13 high-lysine hybrids and 3 open-pollinated high-lysine; as well as 204 yellow cultivars, comprising 184 hybrids, 6 open-pollinated, and 14 open-pollinated with the high-lysine trait. Out of the total 446 cultivars on the list, 93 or 21%, were GM hybrids, 33 being white and 60 yellow. Appearance on the list does not imply marketing. Often there is a lag due to parental and hybrid seed having to be bulked up. Likewise, it takes some time to phase out a hybrid that is being discontinued.

The GM trait ("event") breakdown is shown below.

TABLE 1. TRAIT BREAKDOWN OF GM MAIZE HYBRIDS

TRAIT	WHITE	YELLOW	TOTAL (%)
Bt Insect resistant	26	38	64 (69%)
Herbicide tolerant	3	15	18 (19%)
Bt + Herbicide tol.	4	7	11 (12%)
TOTAL	33	60	93

3.3.3 *GM traits under test*

Field trials are ongoing with existing approved genetic modifications ("events") in new hybrid combinations, and with new events not yet approved for commercial release. The latter include the following:

- **Drought tolerance trait in second year of testing (Monsanto)**
- **Stacked traits, both for herbicide tolerance (Pioneer)**
- **GA 21 herbicide tolerance, Bt11 + GA21 stacked insect resistance and herbicide tolerance, MIR162 insect resistance, and Bt11 + MIR162 for both traits (Syngenta)**

Seed companies are in the process of testing hybrids for water use efficiencies, using conventional and GM breeding techniques. There is also an international initiative on developing drought tolerance maize for Africa called WEMA (Water Efficient Maize for Africa). It is of special interest to note that the past season saw the second round of field trials of a GM drought tolerant maize strain in South Africa.

Sometimes delayed marketing of new hybrids with novel GM traits approved for commercial release is due to having to ensure that the novel genetic events are inserted in the appropriately adapted hybrid to suit South African conditions and also to time required for bulking up of seed. The impact of the stacked genes for insect resistance and herbicide tolerance has now become visible and is expected to increase when seed production is sufficient to replace single trait hybrids with ones that contain stacked traits. This impact is expected to be substantial.

3.3.4 *Analysis of results from survey*

As regards the survey and analyses of results, it should be explained that the reports to the Maize Trust comprise an interim report based on the first round of the survey, followed by an updated final report that uses final seed sales data. The initial results are used in the ISAAA global report that is released in January-February each year and these results are also provided

to the International Grains Council in a cryptic format, as requested by the Department of Agriculture. The year-on-year comparisons in the ISAAA reports are based on first survey data, while those in the final report to the Maize Trust are on the final survey data. Historically, the total GM hectares have changed very little from the first to the final survey. However, the ratio of GM white and yellow maize adoption, and the comparative market shares of the traits may change slightly, while the national share of white, yellow and total GM maize of total maize planted may vary as the CEC estimates are updated.

The analyses expressed as percentages GM, are based of total commercial plantings published by the CEC, as statistics on subsistence and smallholder crops are unreliable. A separate effort was made to analyze incomplete information from companies regarding sales to smallholders.

3.3.5 Commercial maize farmers

As there are no official data on maize farmer numbers available and not all maize farmers produce maize every season, an estimation of farmer numbers is a bit of a guess. Seed companies in 2007 agreed with a figure of between 7 000 and 8 000 large-scale commercial farmers. While some farmers plant only GM maize (discounting the mandatory conventional refuge areas) and others plant both GM and conventional, it was estimated that the between 4 000 and 5 000 commercial farmers plant GM maize. It is likely that these numbers have declined and will continue to decline due to consolidation of farms and, perhaps, land reform.

The final survey in May-June, excluding data on smallholder farmers, required minor adjustments from the October survey. Key results are as follows:

GM maize for the 2008/9 season stood at 1.688 million ha (69.5% of total maize area), comprising 1.046 million ha for white (70.2% of total white maize planted) and 0.642 million ha for yellow (68.4% of total yellow area). This compares to 0.975 (56%), 0.587 (55%), and 1,562 (56%) million ha for white, yellow and total maize planted in 2007/8. Of GM maize area, the major trait is Bt

insect resistance being 61% (71%), RR herbicide tolerance being 19% (24%), and stacked Bt/RR 20% (5%) – figures for 2007/8 in parentheses. The trend towards stacked traits is expected to grow substantially at the expense of single traits, provided that the combined traits are inserted in locally adapted varieties and sufficient seed is available.

SUMMARY:

- **GM white maize hectares increased by 7.3%, GM yellow maize by 9.4% and total GM maize by 8.1% from 2007/8 to 2008/9**
- **GM white maize market share of white increased from 56 to 70.2%, yellow maize share of yellow from 55 to 68.4%, and GM maize of total from 56 to 68.7, from 2007/8 to 2008/9 season.**
- **As for traits, single Bt declined from 71% share of total GM maize in 2007/8 to 61.4% in 2008/9, single trait RR herbicide tolerance declined from 38 to 18.9%, and stacked Bt/RR increased from 5% to 19.7% in 2008/9.**
- **Importantly, GM maize planting increased by 8.1% while total maize area declined by 12.2% over the same period.**
- **Biotech companies are sensitive about publishing analyses of GM details per planting density scenarios; hence, this information will not be included here. Suffice to say that the largest GM area occurs in lower density regions. Therefore, GM seed share of total seed sales will differ from GM share based on area planted.**
- **Two other interpretations are useful: (a) there are no real differences between white and yellow GM maize adoption in total or by trait, and (b) regional analyses (not included) showed that GM adoption occurs in all growing areas to almost the same extent despite pockets of farmers growing conventional maize for specific clients and markets.**

More details are contained in Table 2 below and in the adoption trends on the cover page (in colour) and also in Figure 2 in the Annex.

TABLE 2. COMPARATIVE HECTARES PLANTED AND PERCENTAGE SHARES, BROKEN DOWN BY WHITE, YELLOW AND TOTAL MAIZE, AND BY TRAIT

TRAIT	TYPE	HECTARES	% OF GM MAIZE	% OF TOTAL MAIZE
Bt	White	659 656	39.1%	26.8%
Bt	Yellow	376 240	22.3%	15.3%
Bt	*TOTAL*	*1 035 896*	*61.4%*	*42.1%*
RR	White	159 854	9.5%	6.5%
RR	Yellow	158 634	9.4%	6.5%
RR	*TOTAL*	*318 488*	*18.9%*	*13.0%*
Bt/RR	White	226 282	13.4%	9.2%
Bt/RR	Yellow	106 893	6.3%	4.4%
Bt/RR	*TOTAL*	*333 175*	*19.7%*	*13.6%*
TOTAL GM	White	1 045 792	62.0%	42.6%
TOTAL GM	Yellow	641 767	38.0%	26.1%
TOTAL GM	*TOTAL*	*1 687 559*	*100%*	*68.7%*

Cumulatively, some 6.180 million hectares of GM maize have been planted over the past ten seasons, constituting 3.510 million white ha and 2.670 million yellow ha.

The summarized data over ten years by trait and hectares are shown below, while Fig. 4 in the Annex shows the trends by hectares and by traits.

Area planted to GM white maize (IR = Bt insect resistant, HT =herbicide tolerant)

2000: nil
2001: nil

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% (712 000 IR = 43.8%+ 139 000 HT = 8.5%)
2008: 975 000 ha out of 1.737 mill ha = 56% of total white (696 000 IR =40% + 218 000 HT = 13% + 60 000 IR/HT =3%)
2009: 1 046 000 ha out of 1.489 000mill ha = 70.2% of total (659 656 ha Bt = 44.3% , 159 854 ha HT = 10.7%, 226 282 IR/HT ha = 15.2%, of GM area)

Cumulative area planted to GM white maize over ten (8 effective) years = 3.510 mill ha

<u>Area planted to GM yellow maize (IR = Bt insect resistance, HT = herbicide tolerant)</u>

2000: 3 000 ha
2001: 59 000 ha
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%)
2008: 587 000 ha out of 1.06 mill ha = 55% of total yellow (406 000 IR = 38%, 159 000 HT = 15%, 23 000 IR/HT = 2%)

2009: 642 000 ha out of 938 500 ha = 68.4% (376 000 ha IR =22%, 159 000 ha HT = 6.5%, 106 893 ha IR/HT = 6.3% of GM

Cumulative GM yellow maize area over ten years = 2.670 mil.ha

<u>Total GM maize area planted over ten years (*harvest seasons)</u>

2000: 3 000 ha
2001: 59 000 ha
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
2008: 1.562 mill ha
2009: 1.688 mil.ha

Cumulative GM maize area planted over ten years = 6.2 million (4.5 mil.ha. up to 2007/8 plus 1.7 2009 harvest). Some 23 million MT of GM grain had been produced from these crops (15 million up to 2007/8 plus current 8 million)

It is important to note that 10 years of GM maize successfully grown in South Africa have established a track record of safety to humans, animals and the environment, and reduction of pesticide use, while contributing to crop production efficiency, despite alarmist projections by certain parties. At the same time, it should be recognized that GM technology is only one of the options that producers have in raising efficiency by addressing specific constraints. Monitoring of efficiency and safety should remain an integrated part of post-release assessment.

4.2.6 Household, emergent and small-scale commercial farmers

The number of smallholder maize farmers was more difficult to establish as there were no clear data on numbers of subsistence, smallholder and emergent farmers in South Africa and as seed companies do not maintain accurate records on ethnic grouping

of each farmer who procure conventional or GM seed. The CEC annual estimates of between 400 000 and 600 000 ha under maize by informal farmers, remain a guesstimate.

Some seed is sold by distributors, some seed is supplied to municipalities, projects, or agri-development groups and the end users are not identified, and some buyers share seed with neighbours or members of their farmers' association. Company information was requested from GM seed suppliers: three responded and another indicated that they serve minimal smallholders directly but some direct sales may end up with communities or small-scale farmers. The basic response by seed suppliers was that the transaction cost of serving a household or peasant farmer and visiting him/her in rural areas to sign a sales contract to practice requirements such as refuge rows, does not make such sales viable.

Nevertheless, some good information was provided by three respondents and is summarized below.

TABLE 3. ESTIMATED HECTARES PLANTED BY EMERGENT AND COMMERCIAL BLACK FARMERS BY MAIZE TYPE AND TRAIT

TRAIT	WHITE	WHITE % of WHITE GM	YELLOW	YELLOW % of GM	TOTAL	TOTAL %of GM
Bt	10 750	56%	2 500	14%	13 250	35%
RR	4 774	25%	9 600	53%	14 374	39%
Bt/RR	3 650	19%	6 000	33%	9 650	26%
TOTAL	19 174	100%	18 100	100%	37 274	100%

The sale of GM maize seed as share of total sales to this sector ranged from very little to quite substantial, depending on the company. Almost all these farmers worked dry-land farms

The information on GM and non-GM seed missing from this analysis is (a) companies not selling GM seed to very small farmers, or not keeping separate track of clients by ethnic category (a commercial buyer is a commercial farmer, irrespective of colour); (b) sales to agencies, NGOs, agri-industries, and municipalities that run projects with smallholder farmers and where details of farmers are not available. The status of one agri-business project that managed contract farming for black communities in 2007 and where GM seed was involved, is presently not clear; (c) and the exact breakdown of such sales by trait and region was only partly identified.

There is very little information available of GM and conventional seed sales to clients at household and "peasant" farmers levels, The main deterrent remains the cost and time required to conclude a sale that involves 2, 5, or 10kg of seed and, in the case of GM seed, to get the client to sign a contact to abide by requirements such as refuge areas. One respondent provided the following details:

- **All such small seed bags were sold to dry-land farmers and all involved white maize.**
- **Hectares planted to Bt maize covered 315 ha (25% of GM area), 558 ha to RR herbicide tolerant maize (44% share), and 73 ha of stacked Bt/RR trait (31% share).**
- **Total area planted to GM under this project was 1277 ha.**

NOTE: The areas covered in this section have not been added to that of the commercial sector analysis as that may result in partial or total duplication of data. Most likely, all sales to emergent and commercial black farmers are regarded as part of commercial maize production, while at least some of sales to household and peasant farmers may be part of specific projects. A more complete overview will only be possible when follow-up on seed company sales data to parties who run community projects are divulged. This will be time consuming and expensive, apart from extracting confidential information from stakeholders that are not an integral part of the seed industry, and who may be reluctant to share information.

3.4 South Africa added value of Bt maize

The total volume of GM maize produced from harvest year 2000 to 2008 amounts to over 15.0 million MT, 7.4 being white and 7.6 yellow (reported in 2008). Comparisons of added seed cost versus benefit of herbicide tolerance benefits showed that the net effect over two years, two regions and irrigation and dry-land, is about the same. Therefore, only the benefit of Bt insect resistance was analyzed (single Bt and combined Bt/HT), using an average dry-land yield increase of 10.6% (University of Pretoria studies). Average farm gate prices were obtained from University of Pretoria statistics. The commercial value is estimated at almost R20 billion, and the added value of 10.6% yield benefit estimated at about R2 billion over these nine years (reported in the 2007/8 survey, in Annex 4.3)).

One can extrapolate from this by adding 6.5 million MT Bt GM grain (4.0 white and 2.5 yellow) from the current harvest to bring the total to 20 million MT of which the 2008/9 added Bt value may amount to R1.0 billion calculated at R1400/MT, totaling R3.0 billion. However, missing information concerning some farms where chemical sprays on Bt fields had to be applied and pollination problems on other fields, will reduce this estimated financial benefit. It should be taken into account that the pollination problem is not related to the Bt modification but to conventional issues, as had been covered in media releases.

The analysis is contained in Table 4 in the Annex 4.3.

3.5 Analysis of GMO maize permits

The permit system for approving activities associated with GMOs has undergone some minor changes during the year in terms of requirements and format of the application forms. Due to a change in the website of the Department of Agriculture (from www.nda.agric.za to www.doa.agric.za), accessibility to documents has been temporarily problematic as transcription of all documents from the old to the new website was still in process.

As regards imports of commodity maize, the information summarized below will not harmonize with that of SAGIS; firstly, as a permit granted does not imply that the permit will be used for imports or in the quantities or specified time requested; secondly, the permits apply to the date approved in the calendar year and may not be executed in a marketing period.

Scrutiny of permits conducted earlier this year revealed a number of gross errors that the authorities had not picked up (wrong organisms and wrong applications indicated on system). These were brought to the attention of the GMO Secretariat which made the corrections on the same day. They appreciated my comments as these errors reflected negatively on quality of the official records. Some 272 permits had been approved during the calendar year January to December 2008 which are significantly less than the 379 issued in 2007.

The analysis of permits is as follows:

- **Maize accounted for 84% or 229 (down from the 345 in 2007) permits out of 272 issued**
- **GM maize grain imports numbered 29 involving 0.226 million MT, 26 applicable to imports from Argentina and three from Brazil**
- **For the first time there were permits granted for export of GM grain: four permits for a total of 0.197 MT going into Africa and the Middle East.**
- **Seed imports for commercial sales covered 22 permits amounting to 5581 MT, five times more than in 2007, while other seed imports applied to small shipments intended for breeding, trials, multiplication and re-export.**
- **Seed export permits covered 10 permits for 3430 MT commercial seed, about double that for 2007. The balance of GM seed exports were for small samples for breeding, multiplication, trials, or contained use research. There are still different interpretations of terminology used in different countries as we regard contained use as being enclosed structures such as labs or greenhouses (as defined in the Act) and field trials as open-air, while other parties**

separate field trials on-farm from contained or confined field trials as isolated open-air trials at research facilities.

3.6 Incidence of potential stalk borer resistance to Bt maize

It is inevitable that some degree of resistance to Bt genes may develop, as has been the case with pest and disease resistance developed through conventional breeding. Likewise, pest resistance to chemical insecticides has been well-documented. However, the Bt bio-pesticide as spray and inserted gene has had a unique track record of persistent efficacy over 60 years.

The identification by Prof Koos van Rensburg, ARC-GCI, of resistant larvae in isolated cases of Bt maize plantings under irrigation during 2007/8 has been followed up in collaboration with biotech seed companies. Prof van Rensburg advised me in a recent telephone conversation that incidence of resistance has increased during 2008/9 in the Vaalhartz area and in some dry-land fields and that his investigations are ongoing. He cautioned against confusing resistance in the field with overwintering pupae surviving in maize stalks on the field, natural escapes as the Bt gene does not provide perfect resistance, and variable efficacy due to climatic variation experienced with different planting dates.

It remains important that this investigation continues so that the magnitude of "resistance" can be established and counter measures developed.

3.7 Regulatory developments

The GMO Act is comprehensive and its scope covers all genetic modification technologies, as defined, on all organisms, from registration of facilities where GMO work is done to application on-farm. Approval for GMO activities is based on a permit system. The extent of these permits and policies is contained in Annex 4.4.

Salient points of new regulatory developments can be summarized as follows:

3.7.1 The GMO Act 15 of 1997 had been amended in 2007 to include improved wording in several definitions, addition of the Department of Arts & Culture and the Department of Water Affairs & Forestry in the composition of the Executive Council; to specify two members of the Advisory Committee (one an ecologist and one a human and animal health expert); to include wording to ensure compliance with the Cartagena Protocol on Biosafety; inserting more details pertaining to environmental safety; and some general improvements of texts. The President has subsequently signed the Bill into an Amended Act but it will only enter into force when amended regulations have been approved and published.

3.7.2 The draft amended GMO Regulations have resulted in a large number of submissions, proposals and criticism which caused delays in evaluation of inputs. The most recent information is that the final version is being translated and should be published in the near future.

3.7.3 The Department of Agriculture through its GMO Secretariat requested the SABS to develop standards (coded SANS 910-2009) for GMO management as the GMO Act does not provide for this and as there are inadequate guidelines for handling commodities. Some of these standards are also needed to comply with provisions of the Cartagena Protocol on Biosafety. The scope of the present mandate focuses on "requirements for receiving, handling, transport, and storage of LMOs (live modified organisms) not yet approved for general release". The scope is to include "commodity clearance approval". It defines "producer" as any permit holder or person who produces GM unprocessed agricultural products. "Product" is defined as maize, canola, soya bean, cotton, and cotton oilcake. (By definition, cotton and cotton oilcake are not living entities (LMOs), so why include them -- only live cotton seed is)?

The major sections cover receipt, handling, transport, and storage; receipt and discharge at milling facilities; and control of

spillage, monitoring, disposal; and record control. Kenya had started with drafting similar standards some six months ago and a copy of their first draft is available. One cannot but wonder if the Protocol provisions are not resulting in over-regulation that puts safe grain in the same ambit as hazardous chemicals and whether any African country can implement and enforce such standards. A further question is whether the present standard will replace the current "moratorium" on importing commodities that contain events not yet approved or needed here. Moreover, will the present scope be extended into other practices dealing with GMOs as well?

One good thing is that the drafting team comprises a fairly balanced range of stakeholders:
AFMA, AfricaBio, Cargill, Consumer Goods Council, DowAgroSciences, Grain SA, Pioneer Hi-Bred, Biosafety SA, Louis Dreyfuss Commodities, Departments of T&I, Health, Agriculture, and SABS officials. I seem to miss millers, breweries, silo industries, and industrial processors. Pioneer may represent all biotech seed companies on behalf of SANSOR.

3.7.4 Ms Tsepang Makholela in the GMO-biodiversity unit at the South African National Biodiversity Institute (SANBI) in Pretoria left and was replaced by Ms Lukeshni Chetty. Part of their mandate is to develop post-release monitoring protocols. A personal meeting has been held with this official and reference was made to previous discussions with Ms Makholela in respect of studies required to generate baseline data on non-GM crop impact on biodiversity to serve as guideline for assessing GM crop impact, without which GM impact data will be useless.

3.7.5 The issue of evaluating and regulating GMOs with stacked genes had been delegated in 2007 by the Executive Council to the Department of Environment & Tourism to develop a draft policy document on ecological risk assessment for stacked genes. DEAT subsequently produced a 40 page glossy booklet that deals with Environmental Risk Assessment (ERA) Framework that covers a range of scenarios under which the DEAT Minister may request an ERA before a permit application can be approved, or an ERA can be triggered on existing approved GM events. One of these

deals with stacked genes. Such intervention may occur in terms of Clause 78 of the NEMA Biodiversity Act. Seven sub-scenarios are listed that require assessments of stacked genes. I had previously provided the GMO Secretariat with a copy of the Taiwan policy on stacked genes in commodities. This policy reads as follows: stacked genes for which each event had been previously individually assessed and approved will go through a fast-track process; stacked genes of which some or all events have not been approved must go through a more comprehensive process; and stacked genes that function in similar traits (eg. herbicide tolerance) or in the same metabolic pathway, must undergo a more comprehensive assessment even if the events have been approved individually before stacking.

3.7.6 Assessment of human GM vaccines such as HIV/AIDS and TB, and GM pharmaceuticals, has now moved from the Medicines Control Council in the Department of Health to experts on the GMO Advisory Committee. The process on animal GM vaccines regulated under Act 36/1948 is presently not clear.

3.7.7 The GMO Secretariat recently published the 2009 fees for permit applications in terms of the GMO Act and this schedule is contained in Annexure 4.5. A second relevant notice concerns the required declaration for a commodity export permit that the consignment destined for export has a non-GM status. This now has to contain a certificate from an acknowledged laboratory with details of the test and the consignment sample (Annex 4.6). Adventitious presence of GM content exceeding the 1% level renders the consignment GM. This brings some discipline into declarations but has various practical constraints. Firstly, a threshold level demands a quantitative DNA test for which expensive PCR (polymerase chain reaction) equipment is required and the quick, cheap lateral flow "dipstick" method on the novel protein is not sufficiently accurate, though the technology keeps on improving. Secondly, only one lab is presently recognized for running RT-PCR tests for GM component detection while there are a number of labs that have PCR equipment and can do the same work. To date, there is no central register for labs that can do professional testing for GMOs, mycotoxins, pathogens, or pesticide residues. Neither is there a formal accreditation or

proficiency evaluation system for such labs. Thirdly, the 1% threshold complies with local acknowledged but not statutory level (contained in draft labeling regulation for non-GM certification) and may not be accepted by importing countries.

To this end, a start has been made to investigate requirements for thresholds on GM presence by countries that import commodity maize and on available labs that can or are doing such tests. To date, response from contacts has been disappointing. Confirmed status is as follows: Zambia has a GM-free policy and tests consignments at point of entry by means of the dipstick technique, while their new lab in Lusaka can do PCR tests. Early in 2009 a consignment of some 30 000 MT of maize tested positive, was refused entry and sent back to South Africa. Zimbabwe apparently sets a threshold of 0.5% based on PCR and may require milling of the grain (my contact advised that the authorities will regard any leak of information as a threat to national security and no official will part with any details) . The World Food Programme has been reported to set a 0.2% level but this needs to be followed up. Kenya has never had an embargo on GM imports (confirmed by letter from contact in KEPHIS), requires identification of GM status of consignment, milling of GM grain, and labeling of GM products. Their GMO Biosafety Act has been approved some months ago and a copy is available.

The question on the cost of RT-PCR tests has been clarified. In essence, a dipstick test costs R110 to R300 per sample, and a RT-PCR test will cost R1500 to R3300, depending whether the test is qualitative or quantitative, for the promoter only or for a single gene or more than one gene. There are additional costs for inspections, sampling and milling the sample. I have been provided with details of five companies that provide these services and will make contact with them, and with other labs.

There is an important collateral point to take note of in GM detection. Firstly, dipstick testing has become more accurate but still becomes less reliable as the presence of GM components occurs at low levels. Even PCR is not fail-proof. Secondly, professional sampling of consignments is the key to accuracy – a test result only reflects the status of the sample and not

necessarily of the entire consignment. Thirdly, testing requires both certified reference DNA material to calibrate the equipment and professionally trained lab personnel. A case in point is the well-publisized allegation that a seed consignment to Kenya was "contaminated" with GM. I do not engage in company issues at all but liaised directly with KEPHIS officials to obtain clarity for myself. The outcome was (a) that the party who lodged the charge could not indicate how the consignment was sampled, could not provide information on lot numbers or hybrids tested, could not provide a certified copy of the lab report or a remnant sample of seeds tested. (b) KEPHIS sampled the consignment in accordance with sampling protocols and had the samples tested by a competent lab and no GM presence could be detected. This incidence underpins the need to have labs registered and accredited for GMO detection.

NOTE: On the issue of GMO testing, it may be helpful to note that I participated in an ISTA (International Seed Testing Association) workshop in Zambia in February on behalf of FANRPAN where GM testing of seeds was put on the agenda at my request. Secondly, in February I also attended the Eurofins 2009 Seminar in France as representative of Agri SA. Eurofins are a global consortium of labs whose members provide diagnostic services for testing presence of GMOs, mycotoxins, pesticides, pathogens, etc. If considered useful, the Maize Trust can request a copy of my presentation and report from Agri SA (Hans van der Merwe or Nic Opperman), or I can provide same when approved by Agri SA. (I have recently been invited to serve on the organizing committee of the organization that will run the 2011 international conference on GMO testing in Italy, with my responsibility to promote the event in Africa)

3.7..8 The Consumer Rights Bill drafted by the Department Trade & Industry was signed by the President into an Act, despite objections by various stakeholders and some Parliamentarians. One problematic clause referred to mandatory labeling of "genetically modified ingredients or components" (undefined). It had been inserted in clause 28 together with hazardous chemicals, then taken out and after approval of the Bill by the Portfolio Committee and the NCOP, re-inserted as clause 24 (6). The

President referred the Act back to DTI and Parliament's legal committee, and subsequently signed the Act. It will enter into force when regulations are drafted, approved and published.

Clause 24 (6) reads as follows:
"In addition to the requirements of section 28, any person who produces, supplies, imports or packages any prescribed goods must display on or in association with the packaging of those goods a notice in the prescribed manner and form that discloses the presence of any genetically modified ingredients or components of those goods in accordance with applicable regulations".

Depending on how the applicable regulations will be drafted, the clause may impact on every link in the food production and manufacturing chain.

3.8 Media coverage

Media coverage on the South African GM maize adoption (including cotton and soya beans) was combined with the annual ISAAA global report release that took place in February. The South African information conveyed was based on the first survey completed in October (first report to Maize Trust). As in the past, the final survey did not differ materially from the first, except for an increase in GM market share expressed as percentage planted area due to the CEC estimate having come down from 2.6 million ha to 2.457 while GM seed sales did not decline accordingly. The guest speaker at the media conference was Dr Kobus Laubscher, CEO of Grain SA.

Use was made again of Hans Lombard PR and resulted in wide exposure on radio (five stations plus 1 hour on RSG interview by Freek Robinson and call-in for 50 minutes), Agri TV (3 pre-taped telecasting of 3 to 7 minutes each), and various printed media that included daily, weekly and specialist publications). The advertising value of printed media coverage alone came to R260 000 minimum. This excludes news items carried by news agencies and follow-on presentations and distribution of ISAAA reports to a wide audience.

END ===

Report submitted by

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Pretoria, 16 April 2007

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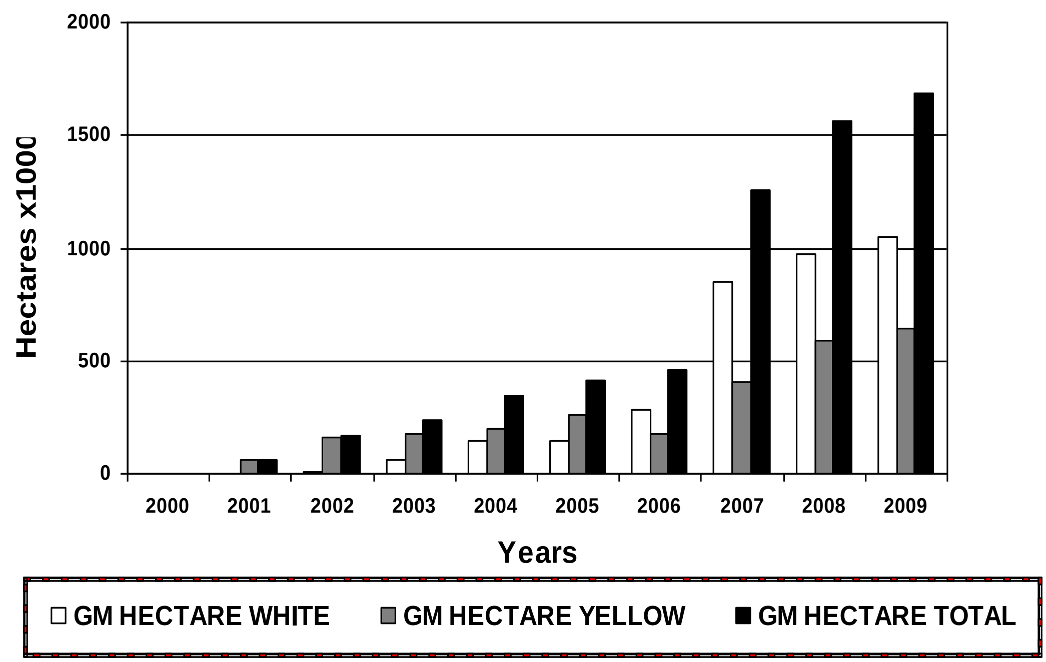
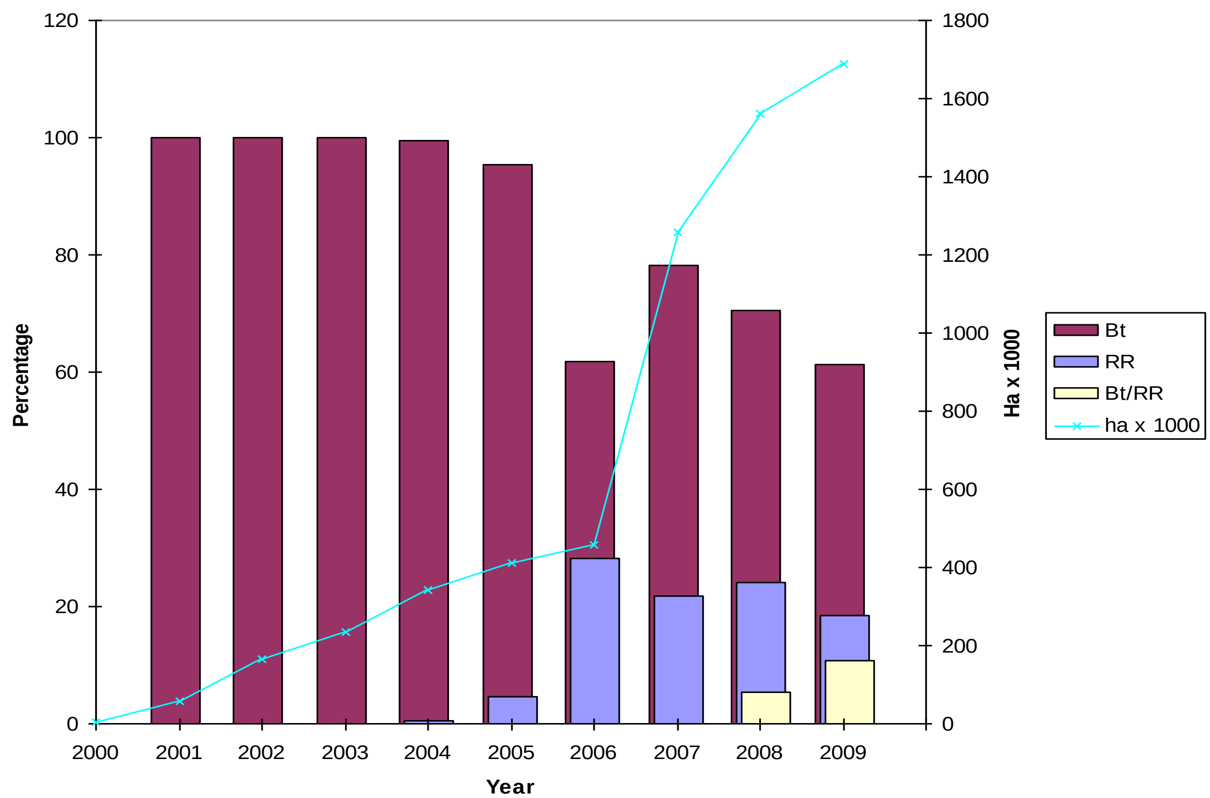
ANNEX 4.1

Figure 2: Trend of South African GM maize hectares 2000-2009 harvest years



ANNEX 4.2

FIGURE 2. TRENDS IN GM TRAIT MARKET SHARE OF TOTAL GM MAIZE AREA (Bt INSECT RESISTANCE, RR HERBICIDE TOLERANCE, STACKED Bt/RR) AND AREA PLANTED IN HECTARES



ANNEX 4.3

CALCULATION OF THE VALUE OF Bt IMPACT (2008 REPORT)

Harvest year	Total hectares ('1000)	Production ('1000 tons)	% Bt	Bt crop ('1000 tons)	Price / ton	Bt crop value ('1000 Rand)	Bt benefit ('1000 Rands)
	WHITE MAIZE						
2000	2,149	6,681	-	-	673	-	-
2001	1,562	4,260		-	1,304	-	-
2002	1,722	5,066	0.4	20	1,540	31,207	2,991
2003	2,232	6,366	2.9	185	1,004	185,352	17,764
2004	1,842	5,805	8.0	464	823	382,201	36,630
2005	1,700	6,541	8.2	536	854	458,053	43,900
2006	1,033	4,187	28.8	1,206	1,422	1,714,727	164,341
2007	1,625	4,315	43.8	1,890	1,799	3,400,056	325,864
2008	1,737	6,861	43.0	2,950	1,810	5,339,916	511,782
	SUB-TOTAL			**7,252**			**1,103,273**
	YELLOW MAIZE						
2000	1,281	4,320	0.2	9	691	5,970	572
2001	1,112	3,226	5.3	171	1,168	199,702	19,140
2002	1,174	4,194	14.5	608	1,293	786,312	75,361
2003	953	3,026	19.5	590	1,047	617,803	59,211
2004	1,001	3,677	19.7	724	863	625,130	59,913
2005	1,110	4,909	22.6	1,109	794	880,891	84,425
2006	567	2,431	17.8	433	1,415	612,296	58,683
2007	927	2,810	35.5	998	1,852	1,847,463	177,062
2008	1,062	4,736	40	1,894	1,764	3,341,722	320,273
	SUB-TOTAL			**6,536**			**854,641**
	GRAND TOTAL			**13,788**			**1,957,914**

Source: Prices – University op Pretoria's Bureau for Food and Agricultural Policy

Production data - Crop Estimates Committee

GM adoption data provided by Wynand van der Walt, FoodNCropBio

ANNEX 4.4

GMO ACT 15/2007
APPLICATION FORMS, POLICIES, GUIDELINES

- Guidance document for use by the applicant to complete the application forms
- Application for a non GMO status certificate for export
- Application for commodity clearance of genetically modified organisms
- Application for general release of genetically modified organisms
- Application for intentional introduction (conduct a trial release) of a genetically modified organism
- Application for contained use of genetically modified organisms
- Application for an extended permit (fast track) for activities with GMOs in SA
- Application for authorisation to export LMOs from South Africa that are destined for (i) contained use or (ii) use as food, feed or processing
- Application for authorisation to export LMOs from South Africa that are destined for intentional introduction into the environment
- Application for authorisation to import LMOs into South Africa that are destined for contained use
- Application for authorisation to import LMOs into South Africa that are destined for intentional introduction (trial release) into the environment
- Application for authorisation to import LMOs that have general release and/or commodity clearance status in South Africa
- Application for affidavit to be completed in the presence of a Commissioner of Oaths
- Application to register a facility for activities involving genetic modification
- Application for authorisation to use imported GMOs as food, feed or for processing in South Africa

Policy and guideline documents

- Standard Operating Procedures with regard to regulation 4 of the GMO Act
- GMO Annual Report
- Standard Operating Procedures with regard to regulation 2(2) of the GMO Act
- Guidelines for compiling a public notice in terms of the Genetically Modified Organisms Act, 1997
- Guideline document for work with genetically modified organisms
- Guideline document for use by the Advisory Committee when considering proposals/applications for activities with genetically modified organisms
- Policy on GMO consignments in transit
- Policy on extension of permits
- Terms of reference for subcommittees to assist the Advisory Committee in terms of section 11(2) of the Genetically Modified Organisms Act, 1997

ANNEX 4.5

DEPARTMENT OF AGRICULTURE

No. R.

GENETICALLY MODIFIED ORGANISMS ACT, 1997
(ACT No. 15 OF 1997)

REGULATIONS: AMENDMENTS

The Minister of Agriculture, acting under section 20 of the Genetically Modified Organisms Act, 1997 (Act No. 15 of 1997), has made the following regulations in the Schedule.

SCHEDULE

Definition

1. In this Schedule "the Regulations" means the regulations published by Government Notice No. R. 1420 of 26 November 1999, as amended by Government Notice Nos. R. 828 of 21 June 2002, R. 576 of 2 May 2003 and R. 495 of 23 April 2004, R. 478 of 27 May 2005, R. 130 of 17 February 2006 and R. 41 of 26 January 2007.

Substitution of Table 2 of the Regulations

2. The following table is hereby substituted for Table 2 of the Regulations with effect from 1 April 2009

DEPARTEMENT VAN LANDBOU

No. R.

WET OP GENETIES GEMANIPULEERDE ORGANISMES, 1997
(WET No. 15 VAN 1997)

REGULASIES: WYSIGINGS

Die Minister van Landbou, handelende kragtens artikel 20 van die Wet op Geneties Gemanipuleerde Organismes, 1997 (Wet No. 15 van 1997), het die regulasies in die Bylae uitgevaardig.

BYLAE

Woordomskrywing

1. In hierdie Bylae beteken "die Regulasies" die regulasies gepubliseer by Goewermentskennisgewing No. R. 1420 van 26 November 1999, soos gewysig deur Goewermentskennisgewings R. 828 van 21 Junie 2002, R. 576 van 2 Mei 2003, R. 495 van 23 April 2004, R. 478 van 27 Mei 2005, R. 130 van 17 Februarie 2006 en R. 41 van 26 Januarie 2007.

Vervanging van Tabel 2 van die Regulasies

2. Tabel 2 van die Regulasies word met ingang 1 April 2009 deur die volgende tabel vervang:

"TABLE 2/ TABEL 2

FEES PAYABLE / GELDE BETAALBAAR

Application/ Aansoek	Fees per application/ Gelde per aansoek
1. Importation/exportation of genetically modified organisms / Invoer/uitvoer van geneties gemanipuleerde organismes	R 300,00 each/elk
2. Contained use of genetically modified organisms/ Beheerde gebruik van geneties gemanipuleerde organismes	R 910,00 each/elk
3. Trial release/ Proefvrystelling	R 2 550,00 each/elk
4. General Release and marketing/ Algemene vrystelling en bemarking	R15 600, 00 each/elk
5. Appeal / Appèl	R 3 700,00 each/elk
6. Fast tracking/ Bespoediging	R 2 050,00 each/elk
7. GMO status certificates/ GGO status sertifikaat	R 130,00 each/elk
8. Registration of facility/ Registrasie van fasiliteit	R 370,00 each/elk
9. Use as food or feed or for processing/ Gebruik as voedsel, voer of vir verwerking	R 210,00 each/elk
10. Commodity clearance	R15 600,00 each/elk

ANNEX 4.6

THE ISSUANCE OF CERTIFICATES ON THE GMO STATUS OF CONSIGNMENTS WHICH ARE COMMERCIALLY AVAILABLE IN INTERMS OF GMO ACT OF 1997 IN SOUTH AFRICA (MAIZE, SOYBEAN AND COTTON)

The Director: Biosafety may issue a certificate stating the GM status of a consignment provided that the applicant can –

(1) Submit proof that the consignment has been tested for the presence of or absence of GMOs using the PCR testing method (quantitative testing) and the gene(s) tested for all events approved in South Africa. Test result should indicate a maximum of 1% presence of GMO in order for a GMO status certificate to be issued

(2) PCR test results will be considered valid for 6 months from date of testing

(3) submit an affidavit stating the following:

- All samples taken are from the consignment in question. Provide details of the consignment.
- All samples taken for testing are representative of the consignment in question. Explain the sampling procedures.
- That the necessary contingency measures will be taken to prevent contamination of the consignment in question after sampling has been conducted and until the consignment has been received by the importing country.
- The test results as provided by a third party is true and has not been tampered with in any way. The original copy or certified copy of test results accompany the application

(4) In the case of exportation, the applicant should adhere to any additional legislative requirements to facilitate the export

THE ISSUANCE OF CERTIFICATES ON THE GMO STATUS OF CONSIGNMENTS NOT IN TERMS OF THE GMO ACT OF 1997

The Director: Biosafety may issue a certificate stating the GM status of consignments provided that the applicant can –

(1) That the applicant submits an affidavit from the Company exporting the consignment in question, is not genetically modified.

(2) Supply a list of the crops in question in the affidavit.

(3) In the case of exportation, the applicant should adhere to any additional legislative requirements to facilitate the export

END OF ANNEXES ============================