INTERIM REPORT TO THE MAIZE TRUST ON SURVEY AND ANALYSIS OF ADOPTION OF GENETICALLY MODIFIED (GM) MAIZE FOR THE 2008/2009- SEASON

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LIST OF CONTENTS

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NOTE

1. ***This interim information is subject to refinements that will lead to the final report The main items for amendments will be the most recent maize area estimations at that stage, any changes in final GM maize seed sales data and details on smallholder farmers.***
2. ***The key data have been incorporated in the ISAAA report on 2008 global GM crop adoption and have been widely covered in local and international printed, radio and television media over the past two months.***

1. OBJECTIVES OF STUDY

The main objective is to research, collect and analyze data pertaining to adoption of GM maize by producers. These analyses involve adoption based on area planted by total maize, white and yellow separate, and by trait and stacked traits (insect resistance and herbicide tolerance). The survey also covers a brief overview of global 2008 biotech/GM crops, new relevant GM traits under test in South Africa and new regulatory developments. This year a brief overview will also be given on policies, biosafety frameworks and regulatory matters related to GM/biotechnology in Southern Africa. The various permits issued during 2008 by the GMO Secretariat of the Department of Agriculture for imports, exports and research purposes related to GM maize will be analyzed.

The data collated in this manner will serve to bring stakeholders up to date, show trends and assist in decision making. Stakeholders include producer organizations like Agri SA, Grain SA, NAFU, grain traders, input supply industries, the Agriculture Business Chamber, biotech seed companies, SAGIS, SAGL, the Department of Agriculture and its GMO Secretariat, the ARC, and media.

2. METHODOLOGY AND APPROACH USED

The initial survey for 2008/9 started in October 2008 and later refined, was conducted with information from

- **Biotechnology companies' confidential information on seed sales (GM and non-GM) in progress and anticipated final sales.**
- **Data provided by the three major biotech seed companies, one major licensor of GM technology, two smaller seed companies and one new entrant. The companies generally concurred with the analyses done as the best estimates based on information available at that stage.**
- **Conversion to hectares planted was done of sales per regional planting density regimes, namely 22-24 kg/ha under high planting populations for irrigation farming, 10-12 kg/ha for dryland farming in the better rainfall central and eastern regions, and 6-8 kg/ha in the drier western regions.**
- **Total anticipated maize hectares were estimated in November at 2.6 million ha based on anticipated seed sales and the intention to plant survey done by the Crop Estimates Committee. This initial estimate was actually similar to the first maize area estimate by the CEC released on January 2009, but higher than the subsequent CEC estimates of some 2.45 million ha.**
- **The percentages of GM adoption in total, by white and yellow maize and by trait are related to the maize areas estimated by the CEC and, thus, will change as these estimates become more exact.**
- **Ratio of white to yellow maize was estimated at 60:40 in November and is close to the first CEC estimate of 62:38.**
- **The estimates of smallholder/emergent farmer adoption of GM maize remain a complex issue and feedback from biotech seed companies is still awaited.**

3. GLOBAL OVERVIEW

GM crops were planted on 125 million ha in 2008, up by 9.4% from 2007, by 13.3 million farmers of whom 90% were smallholders, in 25 countries. It took 10 years to reach one billion acres (400 million ha) cumulatively and only three years to reach the second billion acres. The fastest growth came from stacked traits, namely 23%, accounting for 27 million ha. Key points are (source: C. James, 2008, the International Service for the Acquisition of Agri-Biotech Applications Brief 39):

- **Major biotech countries in order areas planted: USA (62 mill ha), Argentina (21 mill ha), Brazil (15.8 mill ha), India, Canada, China, Paraguay, South Africa.**

- **Five countries – Argentina, Brazil, India, China, and South Africa -- with a combined population of 2.6 billion have been driving GM crop planting in developing countries. Adoption trend in developing countries is higher than in industrial countries.**
- **In Europe 7 countries planted 107 000 ha of GM maize, the only GM crop presently approved: Spain, Czech Republic, Romania, Portugal, Germany, Poland, and Slovakia**
- **South Africa remains in global position 8 on GM area planted**
- **In 2008, South Africa was joined by Egypt with Bt maize and Burkina Faso with Bt cotton**
- **Soybeans remain the most important GM crop with a global area of 66 million ha, followed by maize with 37, cotton with 16 and canola with 6 million ha. A range of other crop species makes up the balance.**
- **Herbicide tolerance comprises 63% of all GM area, stacked traits 22%, insect resistance alone 15%, and virus resistance, altered oils, etc., under 1%.**
- **Benefits of GM crops have been well established: contribution to food security, biodiversity conservation, alleviation of poverty, environmental safety with 359 000 MT a.i. saved over 12 years, reducing greenhouse gases, biofuel production, and economic benefits.**

GM maize global profile

- **GM maize is produced on 37 million ha in 18 countries and makes up 24% of global maize planted. In the US GM maize comprises some 75% of its total 35.5 million ha and Argentina has GM on 70% of its 4 million ha. Brazil has started GM maize in March 2008 with 6% of its 9.2 million ha and moved rapidly on its second planting in December with 17% out of 4.3 million ha. This gives a combined 10% adoption or 1.3 million ha in its first year. Bt maize in Spain rose to 80 000 ha or 22% adoption rate.**
- **US maize moved to stacked traits: 2-stack comprising 30% of GM maize and 3-stack 48%. An 8-stack is expected to be on the market by 2012. Some 29% of maize is used for biofuels and is expected to reach 41% by 2015. Trials showed that drought tolerant hybrids will out-yield the conventional by 8-10% under stress conditions**

A graph on global adoption of GM crops is contained in Annex 1.

4. SUMMARIZED RESULTS

The market shares of South African white and yellow maize and their breakdown by trait, are based on statistics on commercial areas planted.

- **GM maize planting increased by 10 000ha despite a 7% reduction (February) in total maize area (12.5% reduction estimate in March).**
- **GM market share went up by 8% to just over 1.6 million ha: white maize in area and share by 14% and 6%, respectively, while yellow maize increased by 38% for both area and market share, or 724 000 ha and 72%, respectively. This brings the total GM maize area planted to 1.617 million ha or 62% of all maize planted, up from 56% share in 2007. This may increase to 66% when based on the latest reduced total area.**
- **Cumulatively, 6.075 million ha of GM maize has been planted since 2001, of which 3.273 million ha was white maize.**
- **Bt insect resistance remained the major GM trait but its share of the total GM planting continued to decrease as did RR herbicide tolerance, while stacked genes market share of GM area increased almost four-fold from 5% to 19%, 80 000 to 302 000ha.**
- **The composition of GM market by trait is similar for white and yellow maize. For Bt, RR herbicide tolerance and stacked genes, the respective GM shares are 65%, 17% and 18% for white maize, and 64%, 17% and 19% for yellow. Stacked traits are expected to grow rapidly to become the major GM component, the rate depending upon available seed and appropriate varieties.**

More interim data and analyses are contained in the Annex.

4. ANALYSIS OF PERMITS GRANTED FOR 2008

The biosafety framework under the GMO Act is primarily based on an approval system for which permit applications are required. In analyzing these permits, the author noticed various glaring errors and other uncertainties in classifications. These have been brought to the attention of the GMO Secretariat and some serious mistakes also communicated to the companies concerned for clarification. Thus, this analysis is subject to amendments for the final report.

Two matters should be explained: firstly, the fact that an applicant receives a permit for export or import does not mean that the party will execute that approval in the quantity or within the time frame, or at all. Therefore, the statistics will not match that of the SAGIS surveys that run from May to April. Secondly, for researchers the classification of import for contained use usually means use in a laboratory or greenhouse (as per GMO Act

definition) but for foreign importers it mostly includes confined field trials on research premises. Our forms do not make provision for distinguishing contained use from confined trials, but local application classifies field trials as a separate use. Permits for GM commodities in transit passage to neighbouring countris are not contained in the permit list on the website.

Based on quantities involved in the permits, the author arbitrarily assumed the following:

- **Commodities are clearly defined and indicated by volume and origin/destination**
- **Consignments over 2.9 MT intended for planting are assumed to be for commercial sale but may contain some parent seed for seed production**
- **Consignments between 20 kg and 2.9 MT are considered for field trials**
- **Consignments below 20 kg are considered intended for contained or field use in research and breeding but may contain some batches for multiplying new parent lines from breeder seed.**

Results are as follows:

- **Import commodity GM maize: 24 permits, 63 600 MT total**
- **Import for planting (seed sale): 27 permits, 10 635 MT**
- **Imports for field trials from 20Kg to 2.9MT: 39 permits, 28 MT**
- **Imports for research, breeding below 20KG: 41 permits, 265 kg**

- **Export commodity GM maize: 4 permits, 203 000 MT total**
- **Export over 2.9 MT for planting (seed sales): 11 permits, 34 306 MT (7 500 MT dubious)**
- **Export 20kg to 2.8 MT for trials(contained use): 26 permits, 5.5 MT**
- **Export below 20Kg for research, breeding: 47 permits, 243 kg.**

NOTE: This was the first year that trader applications for commodity exports of maize that is or contains GM components have been formally shown. Destinations of all four were other continents. The number of maize commodity import permits and quantities were less than in 2007 (213 against 223 for 2007). A rough comparison with SAGIS information correlates with this although their marketing year runs from May to April -- 27 000 MT grain imported (as per telephone conversation). There is also some correlation with GM maize grain exports.

5. REGULATORY DEVELOPMENTS IN SOUTH AFRICA

The amended, updated GMO regulations have almost been completed following a large number of submissions, and documentation has been sent

to the legal advisors of the Department of Agriculture (as per unofficial communication). Once accepted, the regulations will go to the Minister for signing and publishing in the Government Gazette and the amended GMO Act will enter into force. There will be no more opportunity for comments or inputs from stakeholders.

Ms Tsepang Makholela in the unit for GMOs and their impact on biodiversity at SA National Biodiversity Institute in Pretoria left and the manager of the unit remains Ms Lukeshni Chetty. There has been no feedback as yet on their studies on GMO impact.

PlantBio, one of the Biotech Regional Innovation Centres, has established a national biosafety platform, Biosafety South Africa, with Dr. Hennie Groenewald as executive director. They envisage rendering some services to parties in respect of complying with regulatory systems and will generate information through project studies. PlantBio and Biosafety SA report to the Department of Science & Technology.

The Consumer Protection Bill has not yet been signed by the President and has been referred back to the Parliamentary legal committee and DTI for considering the many objections received, primarily those dealing with the poorly scripted mandatory labeling of "genetically modified ingredients".

The GMO Secretariat distributed a new requirement, namely that application for permits for exports of commodity grains be accompanied by a lab certificate that indicates consignment details and whether it contains 1% or less GM components to qualify for non-GM status. This implies quantification of GM detection in lots. At other levels we are urging for identification and registration of labs that are equipped to conduct such tests, and that labs undergo regular referee and proficiency testing of personnel and equipment.

6. REGULATORY DEVELOPMENTS IN THE REGION

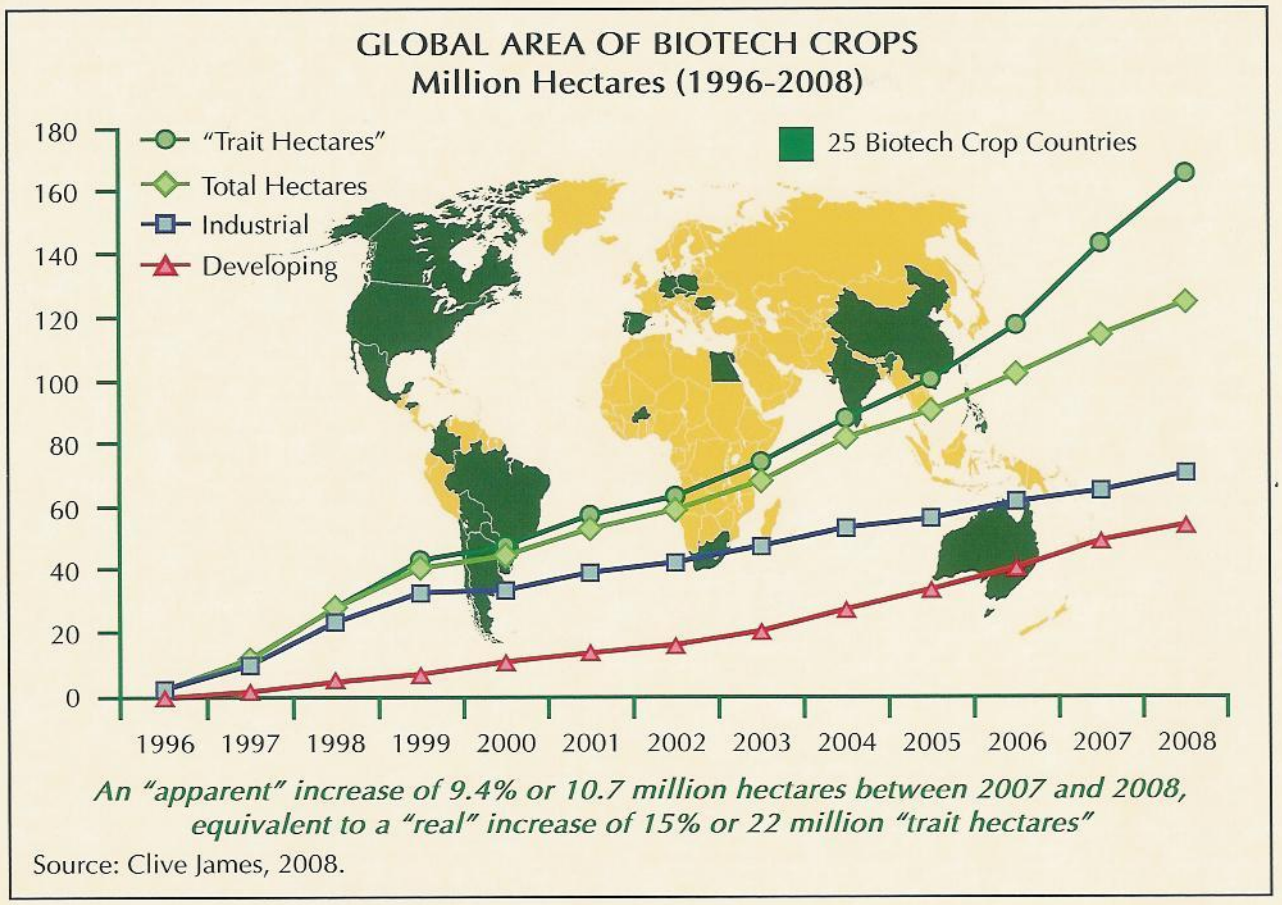
The 14 –member country SADC region envisages to be a customs union within two years, a common market three years later and have a common currency by 2017, It is hoped that SADC will hopefully approve the proposals and documentation for facilitating seed movement in the region by way of a regional variety list, reduced variety registration time, reduced pathogen list for phytosanitary requirements, common standards for seed testing and seed certification, and a model for plant variety protection. The SADC committee on biotechnology and biosafety harmonization has not met in three years and is functionally dead. There seems to be no political

will to harmonize biotech policy and biosafety regulations, and trade complications will remain.

COMESA (Common Market for Eastern and Southern Africa) has appointed a panel of experts (the author being member) to prepare harmonized biotech policies and biosafety frameworks for the region that includes some SADC members, but not South Africa. The objective is to facilitate farmer access to GM crop technologies, field trials and adoption, and movement of relief food supplies. A drafting team has recently been charged with developing the documentation for further evaluation by the panel.

END>>>>>>>>>>>>>>>>>>

ANNEX TO FOLLOW BELOW


GLOBAL AREA OF BIOTECH CROPS
Million Hectares (1996-2008)
"Trait Hectares"
Total Hectares
Industrial
Developing
25 Biotech Crop Countries
180
160
140
120
100
80
60
40
20
0
1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008
An "apparent" increase of 9.4% or 10.7 million hectares between 2007 and 2008, equivalent to a "real" increase of 15% or 22 million "trait hectares"
Source: Clive James, 2008.

No. 39 - 2008

Figure 1: Trend of South African GM maize hectares 2000-2009 harvest seasons

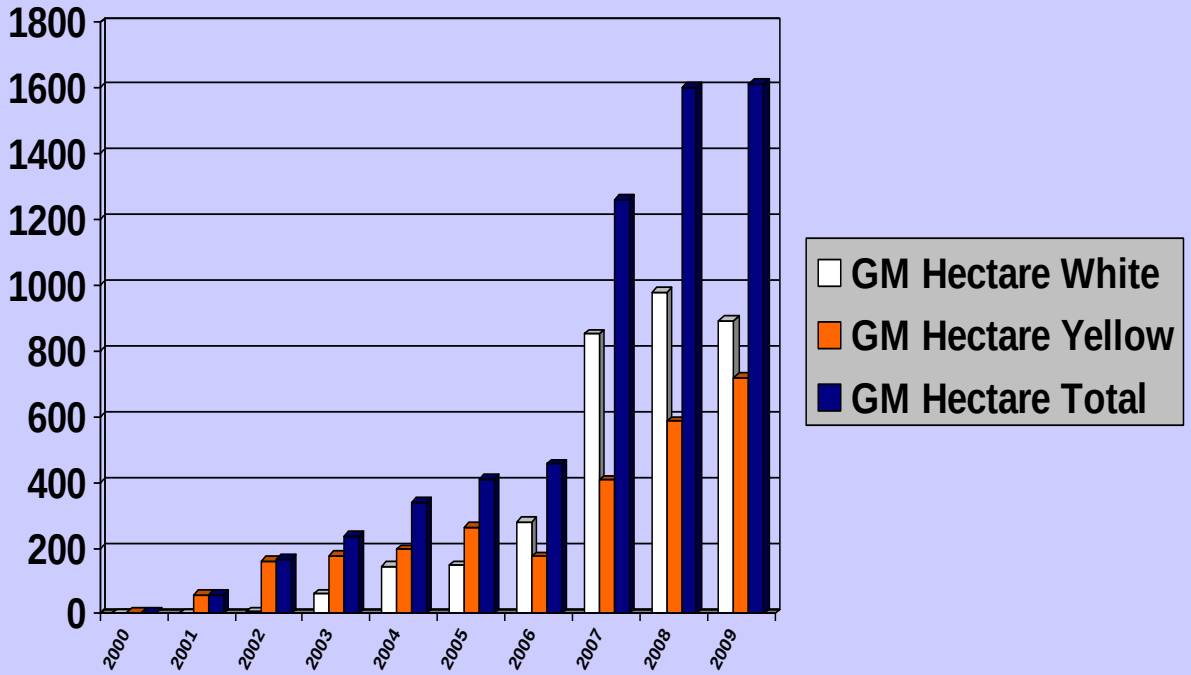


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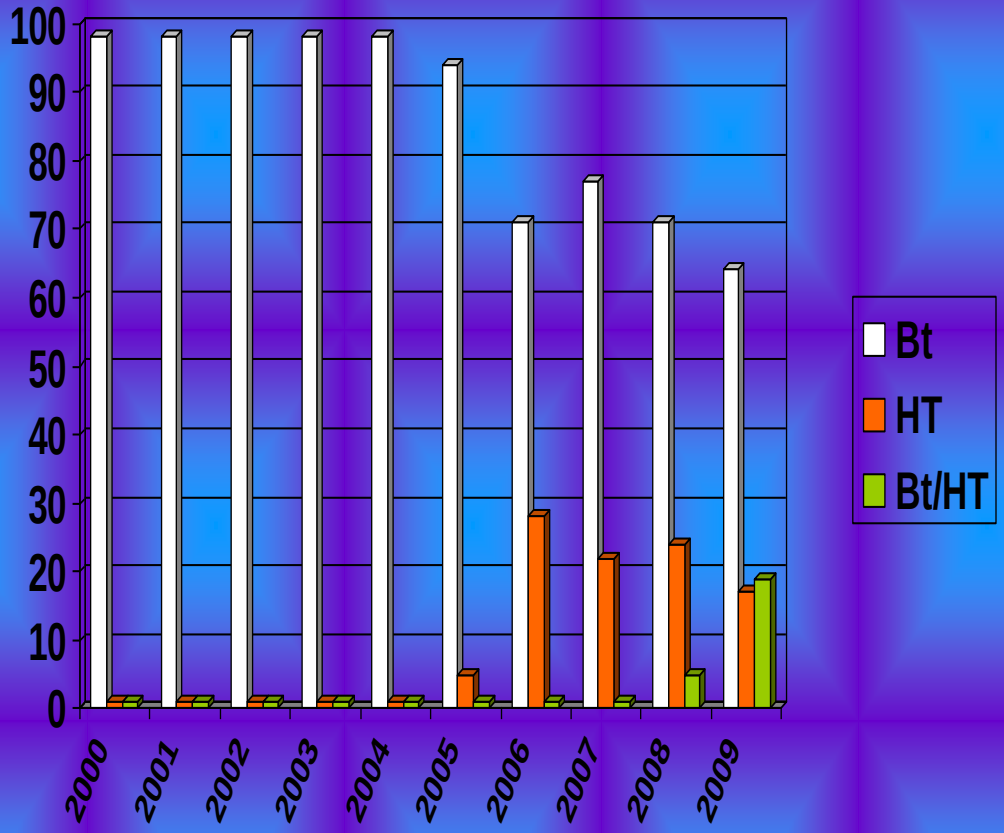
Figure 2: Trends of South African GM maize as percentage of total GM by trait 2000-2009 harvest seasons



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