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# GAIN Report

Global Agricultural Information Network

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## **South Africa - Republic of**

### **Agricultural Biotechnology Annual**

#### **Enter a Descriptive Report Name**

**Approved By:**

Ross Kreamer

**Prepared By:**

Dirk Esterhuizen

**Report Highlights:**

The production of biotech crops in South Africa continued to expand in 2010 to reach 2.2 million hectares, making South Africa the ninth largest producer of biotech crops in the world. South Africa's new Consumer Protection Bill came into effect on April 1, 2011. The new act require virtually every product label in South Africa's food and beverage industry to be changed to comply with mandatory GMO labeling requirements. The intent of the law is to prevent exploitation or harm of consumers and to promote the social well being of consumers. Post expects mandatory GMO labeling for all domestic and imported GMO food products and liability clauses in this bill will directly affect U.S. companies with food and agricultural interests in South Africa.

Sections I, II, III and V were updated.

## Section I. Executive Summary:

South Africa possesses a highly advanced agricultural industry based *inter alia* on first-generation biotechnologies and effective plant breeding capabilities. The country has been involved with biotechnology research and development for over 30 years and will continue to be the biotechnology leader on the Africa continent. The production of biotech crops in South Africa continued to expand in 2010 to reach 2.2 million hectares, making South Africa the ninth largest producer of biotech crops in the world, illustrating that South African farmers have adopted biotech and the benefits thereof. Genetically Modified (GM) corn plantings represent 83 percent of total biotech planting in South Africa, followed by GM soybeans (approximately 16 percent) and GM cotton. Almost 77 percent of corn plantings, 85 percent of soybean plantings and all cotton plantings in South Africa are GM. All of the GM events that are currently commercially produced in South Africa were developed in the United States. However, due to the fact that the United States has approved corn events that are not yet approved in South Africa, United States commercial corn is not authorized to enter into South Africa.

South Africa is a net exporter of agricultural, fish and forestry products. The Netherlands and the United Kingdom are the major destination of South Africa's agriculture, fish, and forestry products and represents almost 20 percent of total exports. South Africa's exports of agricultural, fish and forestry products to the United States were \$218 million in 2010, 17 percent more than in 2009, and accounts for more than 3 percent of agricultural exports by South Africa. Citrus (\$41 million), wine (\$39 million) and nuts (\$27 million) were the major items exported to the United States. South Africa's major partner for importing agriculture, fish, and forestry products is Argentina, which accounts for almost 12 percent of imports. Imports from the United States increased by 60 percent to a record \$269 million in 2010 and represents 5 percent of South African imports of agriculture, fish, and forestry products. The increase in imports from the United States was due to an increase in wheat imports. Wheat (\$75 million), prepared food (\$33 million) and animal offals (\$6 million) were the major products imported from the United States by South Africa in 2010.

The amendments to the GMO Act of 1997 that were published and gazetted in April 2007 came into effect in February 2010. According to the amendments scientifically based risk assessment is a prerequisite for decision making related to and Genetically Modified Organisms (GMO). The Amendments also authorize the Executive Council to determine if an environmental impact assessment is required under the National Environmental Management Act. The amendments also add specific legislation to allow socio-economic considerations to factor into decision making and makes those considerations significantly important in the decision making process.

On April 1, 2011, the South African Department of Trade and Industry (DTI) published regulations in the Gazette that brought the new Consumer Protection Act (68/2008) into enforcement. The primary purpose of the act is to prevent exploitation or harm of consumers and to promote the social well being of consumers.

However, according to the act mandatory labeling of GMOs is required for all domestic and imported food products, for example:

- All food containing more than five percent genetically modified ingredients, whether produced in South Africa or elsewhere, needs to carry the declaration which states, "contains at least five percent genetically modified organisms" in a conspicuous and easily legible manner and size.
- Those products that contain less than five percent of genetically modified organisms

(GMOs) may be labeled "Genetically modified content is below five percent".

- If it is impossible or not feasible to test goods for the presence of GMOs, the product must be labeled "may contain GMO ingredients".
- Less than one percent – maybe labeled as does not contain genetically modified organisms

## **Section II. Plant Biotechnology Trade and Production:**

## Current Status

Table 1 shows all the GMO events that have been approved for commercial use in South Africa. All the GMO events that are currently commercially available in South Africa were developed in the United States. These events is present in three crops namely, corn, soybeans and cotton. In 2010, four new events in corn were approved; two stack events, an insect resistance trait and an herbicide tolerant trait. Syngenta and Monsanto were the companies involved.

**Table 1: GMOs approved for general release in South Africa**

Company	Event	Crop	Trait	Year approved
Syngenta	BT11xGA21	Corn	Insect resistant Herbicide tolerant	2010
Syngenta	GA21	Corn	Herbicide tolerant	2010
Monsanto	MON89034xNK603	Corn	Insect resistant Herbicide tolerant	2010
Monsanto	MON89034	Corn	Insect resistant	2010
Monsanto	Bollgard II x RR flex (MON15985 x MON88913)	Cotton	Insect resistant Herbicide tolerant	2007
Monsanto	MON88913	Cotton	Herbicide tolerant	2007
Monsanto	MON810 x NK603	Corn	Insect resistant Herbicide tolerant	2007
Monsanto	Bollgard RR	Cotton	Insect resistant Herbicide tolerant	2005
Monsanto	Bollgard II, line 15985	Cotton	Insect resistant	2003
Syngenta	Bt11	Corn	Insect resistant	2003
Monsanto	NK603	Corn	Herbicide tolerant	2002
Monsanto	GTS40-3-2	Soybeans	Herbicide tolerant	2001
Monsanto	RR lines 1445 & 1698	Cotton	Herbicide tolerant	2000
Monsanto	Line 531/Bollgard	Cotton	Insect resistant	1997
Monsanto	MON810/Yieldgard	Corn	Insect resistant	1997

## Corn

Corn is the main field crop produce in South Africa and is use for both human (mainly white corn) and animal (mainly yellow corn) consumption. The first GM corn event (insect resistant) approved in South Africa was in 1997 and since then there was a progressive and steady increase in GM corn plantings. Table 2 illustrates the plantings of GM corn in South Africa the past 6 years. GM corn plantings increased from 28.5 percent of total South African corn planted in the 2005/06 production year to 76.9 percent in the 2010/11 production year. Of the 1.825 million hectares of corn planted with GM seed in the 2010/11 production year, single Bt comprised 45.6 percent, herbicide tolerant 13.4 percent and stacked Bt and herbicide tolerant 41 percent (see also Table 3). White corn planting in the 2010/11 production year were 1.418 million hectares of which 74.8 percent or 1.060 million hectares were GM seed, while 80.2 percent or 765,000 hectares of the 954,000 hectares of yellow corn were GM.

**Table 2: Planting of GM corn in South Africa the past 6 years**

Production years	Area planted '000 ha		
	White corn	Yellow corn	Total corn
<b>2005/06</b>			
<b>Total</b>	1,033	567	1,600
<b>Biotech</b>	281	175	456
<b>% of total</b>	27.2%	30.9%	28.5%
<b>2006/07</b>			
<b>Total</b>	1,625	927	2,552
<b>Biotech</b>	851	528	1,379
<b>% of total</b>	52.3%	56.9%	49.3%
<b>2007/08</b>			
<b>Total</b>	1,737	1,062	2,799
<b>Biotech</b>	975	588	1,563
<b>% of total</b>	56.1%	55.3%	55.8%
<b>2008/09</b>			
<b>Total</b>	1,489	939	2,428
<b>Biotech</b>	892	724	1,616
<b>% of total</b>	59.9%	77.1%	66.3%
<b>2009/10</b>			
<b>Total</b>	1,720	1,023	2,743
<b>Biotech</b>	1,212	667	1,879
<b>% of total</b>	70.4%	65.2%	68.5%
<b>2010/11</b>			
<b>Total</b>	1,418	954	2,372
<b>Biotech</b>	1,060	765	1,825
<b>% of total</b>	74.8%	80.2%	76.9%

**Source:** FoodNCropBio supported by the Maize Trust

**Table 3: Percentage of the biotech corn crop that was planted with the different traits the past 6 years**

<b>Production year</b>	<b>White corn</b>	<b>Yellow corn</b>	<b>Total corn</b>
<b>2005/06</b>			
<b>% Insect Resistant</b>	78.6	61.1	71.9
<b>% Herbicide Tolerant</b>	21.4	38.9	28.1
<b>% Stacked</b>	0	0	0
<b>2006/07</b>			
<b>% Insect Resistant</b>	83.7	71.6	79.8
<b>% Herbicide Tolerant</b>	16.3	28.4	20.2
<b>% Stacked</b>	0	0	0
<b>2007/08</b>			
<b>% Insect Resistant</b>	71.4	69.2	70.6
<b>% Herbicide Tolerant</b>	22.4	27.1	24.1
<b>% Stacked</b>	6.3	3.7	5.3
<b>2008/09</b>			
<b>% Insect Resistant</b>	65.9	62.9	64.0
<b>% Herbicide Tolerant</b>	16.6	18.1	17.2
<b>% Stacked</b>	18.5	19.0	18.7
<b>2009/10</b>			
<b>% Insect Resistant</b>	81.2	48.9	69.7
<b>% Herbicide Tolerant</b>	9.7	23.0	14.4
<b>% Stacked</b>	9.2	28.1	15.9
<b>2010/11</b>			
<b>% Insect Resistant</b>	50.2	38.8	45.6
<b>% Herbicide Tolerant</b>	8.5	20.7	13.4
<b>% Stacked</b>	41.3	40.5	41.0

**Source:** FoodNCropBio supported by the Maize Trust

South Africa is the major exporter of corn on the Africa continent and a large percent of South African corn exports are destined for countries in Africa. In the 2009/10 and 2010/11 marketing years, South Africa exported 1.7 million and 2.1 million tons of corn, respectively. In the 2009/10 marketing year more than 50 percent of South Africa's corn exports were destined for Kenya, which was severely hit by a drought that left a third of its population in need of food aid. A transaction of corn exported to Kenya attracted media attention as the first 40,000 tons of the order got stuck at Mombasa harbor as a result of protests against South Africa's GM corn entering Kenya. The protesters, led by the environmental group Kenyan Biodiversity Coalition, said East Africa's biggest economy had a bumper harvest, and the contaminate GM corn imports from South Africa had not been authorized by the Kenyan government.

However, the issue, which was a technical and administrative matter between the two countries, was resolved and exports continued.

With one of the largest corn crops ever produced in the country, South Africa had approximately four million tons of corn available for export in the 2010/11 marketing year. South Africa exported approximately half of that to 23 countries around the world. The largest share was exported to Korea, which acquired 610,721 tons of yellow corn and 205,317 tons of white corn. Korea was followed by Botswana (176,114 tons) and Italy (131,107 tons). In total South Africa exported 2.1 million tons of corn in the 2010/11 marketing year of which 1.051 million tons was white corn and 1.018 million tons yellow corn. With a carry-over stock of approximately four million tons and a current crop of approximately 11 million tons, it is expected that South Africa will export another two million tons of corn in the 2011/12 marketing year, especially given the developing drought situation in Eastern Africa. More than 75 percent of this corn is GM.

Due to the fact that the United States has approved corn events that are not yet approved in South Africa, United States commercial corn is not authorized to enter into South Africa. South Africa is not opposed in principle to these events, but if they have not made it through the regulatory approval process of South Africa they cannot be imported. Commercial corn that contains biotech events that are already approved in South Africa is not affected by this.

However, U.S. food aid destined to Lesotho, Malawi, Swaziland, Zambia and Zimbabwe ordinarily passes through the port of Durban, South Africa. In order for the shipment to pass through South Africa, the GMO Registrar's Office requires several measures:

- Advance notification so that proper containment measures can be taken;
- Letter from the recipient country stating that they accept the food aid consignment and that they know that it contains GMOs;
- Milling near the port. Southern African Development Community (SADC) regulations state that if food aid has biotech content then it must be milled.

## **Soybeans**

GM soybeans were first approved for commercialization in South Africa in 2001; by 2006, 75 percent of the soybean crop grown was GM. In the 2010/11 season the area planted with soybeans increased by 34 percent, from 311,450 hectares in the 2009/10 season to 418,000 hectares. An estimated 85 percent of the 2010/11 season's soybeans plantings are GM (herbicide tolerant). In 2009, Soybean production surpassed sunflower production the first time in South Africa's agricultural history as the most important oilseed crop produced. One reason for this is the fact that the production of soybeans is made relatively easier with the GM cultivars that are available in South Africa and the fact that most of soybeans' production processes can now be mechanized.

## **Cotton**

Bt cotton was the first GM crop variety to be grown commercially in sub-Saharan Africa. Early adopters were small-scale farmers in the Makhatini Flats in Kwazulu-Natal, South Africa, who have been growing the crop since 1998. Total cotton planting in 2010 was 15,000 hectares up from almost 8,300 hectares in 2009. All cotton plantings in South Africa are GM. The stacked variety is the most

favoured one and represents 95 percent of total cotton planting.

## **Biotech crops under development**

### **Permits issued**

The Executive Council (EC) review all applications submitted in terms of the GMO Act and use a case-by-case and precautionary approach to ensure sound decision making in the interest of safety of the environment and the health of human and animals. Most applications considered by the EC involve GM corn, soybeans and cotton and in most cases represent modifications and refinements of existing traits. Mindful of other challenges beyond that of agriculture, the EC also evaluate applications for vaccine trials involving GMOs.

South Africa has seen an increase in the submission of comments on GMO permit applications from a wider audience of stakeholders and interested parties in recent years. These organizations include academic institutions, consumer forums, commodity organizations, provincial departments, and other stakeholder organizations representing the anti- and pro-GMO movements.

In terms of the GMO Act a total number of 398 permits were issued in 2010, compared to 359 in 2009 and 272 in 2008. Until May this year, 114 permits have already been issued. The majority of permits being issued were for the import and export of GM crops (see also Table 4). Imports focused mainly on commercially approved corn, soybeans and cotton for activities relating to planting, contained use, food and feed. In addition, imports also include GM HIV and tuberculosis vaccines for contained use in South Africa. The main exports permits issued included GM corn and to a lesser degree GM cotton primarily for contained use, planting activities and under the new amendments to the GMO act, GM corn exported as a commodity for human and animal use. Two commodity clearance applications were received in 2010, compared to 24 in 2008 and none in 2009. These applications are basically for corn for the use as food, feed and processing and did undergo safety assessments.

**Table 4: Summary of GMO permits issues in South Africa from 2008**

	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011 (until May)</b>
<b>Exports</b>	95	167	225	81
<b>Imports</b>	135	150	128	25
<b>Trials</b>	16	35	33	7
<b>Contained use</b>	2	7	6	1
<b>Commodity use</b>	24	0	2	0
<b>General release</b>	0	0	4	0
<b>Total</b>	<b>272</b>	<b>359</b>	<b>398</b>	<b>114</b>

Four general release permits for commercialization were issued in 2010, the first time since 2007. Since the beginning of 2008, 72 field, or clinical trials permits were authorized. Table 5 summarizes the event, trait, product and company involved of the permits issued. The products include corn and cotton for evaluation of insect resistance and/or herbicide tolerance and the long-awaited drought tolerance in



corn as well as for the evaluation of GM sugar with altered sugar content and growth rate. Clinical trial permits were issued for measles, HIV and tuberculosis vaccines.

**Table 5: GMOs approved for trial release from 01/01/2008 to 05/31/2011**

<b>Company</b>	<b>Event</b>	<b>Crop/product</b>	<b>Trait</b>
<b><u>Syngenta</u></b>	BT11 X GA21	Corn	Herbicide tolerance Insect resistant
	GA21	Corn	Herbicide Tolerance
	MIR162	Corn	Insect resistant
	BT II x MIR162	Corn	Herbicide tolerance Insect resistant
<b><u>Monsanto</u></b>	MON87460	Corn	Drought Tolerance
	MON89034 X NK603	Corn	Insect Resistant Herbicide Tolerance
	MON89034	Corn	Insect Resistant
	MON87460	Corn	Drought Tolerance
	MON89034	Corn	Insect Resistant
<b><u>Bayer</u></b>	GlyTol x LLCotton25	Cotton	Herbicide tolerance
	GHB119	Cotton	Insect Resistant Herbicide Tolerance
	BG II x LLCotton25	Cotton	Insect Resistant Herbicide Tolerance
	T304-40	Cotton	Insect Resistant Herbicide Tolerance
	GHB614	Cotton	Herbicide tolerance
	GHB614 x LLCotton25	Cotton	Herbicide tolerance
	Bollgard II x LLCotton25	Cotton	Herbicide tolerance Insect resistant
	Twinlink x GlyTol	Cotton	Herbicide tolerance Insect resistant
	Bollgard II x GlyTol x LLCotton25	Cotton	Herbicide tolerance Insect resistant
	Twinlink	Cotton	Herbicide tolerance Insect resistant
<b><u>Triclinium</u></b>	MVA-mBN85B	Vaccine	Measles
	VIR201	Vaccine	HIV
	AERAS-402	Vaccine	HIV

	MVA/AERAS-485-recombinant MVA	Vaccine	TB
	MVA85A	Vaccine	TB
	AERAS-402	Vaccine	TB
	VPM1002	Vaccine	TB
	MVA85A/AERAS485	Vaccine	TB
	OncoVEX		
<b>SASRI</b>	NC0310	Sugarcane	Alternative sugar
	pASNI	Sugarcane	Growth rate/yield & altered sucrose content
	pSVPPase	Sugarcane	Growth rate/yield & altered sucrose content
	pAUGdf510	Sugarcane	Growth rate/yield & altered sucrose content
	pihUMPS	Sugarcane	Increase yield & sucrose content
	pCel	Sugarcane	Increase cellulose content
	piHADK	Sugarcane	Increase yield & starch content
	piAGPase	Sugarcane	Decrease starch content
<b>Pioneer</b>	MON810 x MIR162	Corn	Herbicide tolerance Insect resistant
	59122	Corn	Insect resistant
	TC1507	Corn	Insect resistant
	98140	Corn	Herbicide tolerance
	98140 x MON810	Corn	Herbicide tolerance Insect resistant
	TC1507 x MON810	Corn	Herbicide tolerance Insect resistant
	TC1507 x MIR162	Corn	Herbicide tolerance Insect resistant
	98140 x TC1507 x MON810	Corn	Herbicide tolerance Insect resistant
	TC1507 x MON810 x NK603	Corn	Herbicide tolerance Insect resistant
	TC1507 x MIR162 x NK603	Corn	Herbicide tolerance Insect resistant
	TC1507 x MON810 xMIR162	Corn	Herbicide tolerance Insect resistant
	PHP36827	Corn	Herbicide tolerance Insect resistant
	PHP37046	Corn	Herbicide tolerance

			Insect resistant
	PHP36824	Corn	Herbicide tolerance Insect resistant
	PHP37048	Corn	Herbicide tolerance Insect resistant
	PHP37049	Corn	Herbicide tolerance Insect resistant
	PHP36826	Corn	Herbicide tolerance Insect resistant
	PHP37047	Corn	Herbicide tolerance Insect resistant
	DP-32138-1	Corn	Male fertility Pollen infertility
	PHP37050	Corn	Herbicide tolerance Insect resistant
<b>PPD</b>	MEDI-534	Vaccine	Intranasal
<b>SUN</b>	-	Grapevine	-
<b>Wits</b>	SAAVI rMVA TBC-M456	Vaccine	
	SAAVI MVA-C TBC-M456	Vaccine	HIV
<b>ARC-IIC</b>	TMS60444 Line 3.1 & 3.2	Cassava	Starch enhanced

Since 2008, 12 contained use permits were issued for GM corn, cassava, sorghum and ornithogalum (see also Table 6)

**Table 6: GMOs approved for contained use from 01/01/2008 to 05/31/2011**

<b>Company</b>	<b>Event</b>	<b>Crop/product</b>	<b>Trait</b>
ARC-VOPI	Rolou A2:1 & A2:4	Ornithogalum dubium x thyrsoides	-
ARC-IIC	TMS60444 Line 3.1 & 3.2	Cassava	Starch enhanced
CSIR	ABS1	Sorghum	Nutritional composition
Monsanto	MON89034	Corn	Insect resistant
	MON89034 x NK603	Corn	Herbicide tolerance Insect resistant
	ZM70774	Corn	Insect resistant
Pioneer	98140 x Mon810	Corn	Herbicide tolerance Insect resistant
	TC1507	Corn	Insect resistant
	98140	Corn	Herbicide tolerance
	TC1507 x MON810	Corn	Herbicide tolerance Insect resistant
	59122	Corn	Insect resistant

## **Grapevines**

The South African wine and table grape industries are funding research to develop GMO grapevines. The research is focused on the development of fungal and viral resistant vines and the metabolic engineering of grapevines towards enhanced environmental stress resistance and improved grape berry quality factors such as color and aroma. Several transgenic grapevine lines are being evaluated in greenhouse trials. In 2006, the Institute for Wine Biotechnology at Stellenbosch University applied for a permit to perform the first GM grapevine field trials in South Africa. The objectives of the trial were to evaluate the morphology, growth, and fruit quality of the transgenic plants under field conditions. In September 2007, the Advisory Committee (AC) evaluated the application and a list of questions about the trial was referred back to the applicant. The applicant responded to those questions and the permit for field trials was finally approved in September 2009. Wine is one of the major agricultural products exported to the United States by South Africa, with an annual value worth around \$40 million.

## **Bt Potato**

The tuber moth resistant Bt potato, SpuntaG2, developed by the South African Agricultural Research Council and Michigan State University was denied general release by the EC in 2009. The EC dismissed the application for a permit to release the potato on safety and economic grounds. The Agricultural Research Council appealed against the EC's decision in October 2009. The appeal decision is still pending.

The potato, SpuntaG2, contains a gene from the soil bacterium *Bacillus thuringiensis* which acts like a built-in pesticide against the tuber moth (*Phthorimaea operculella*). The moth caused R40 million (US\$5 million) of losses to the potato industry in 2008. Scientists had hoped the potato would allow farmers to use fewer pesticides, reducing costs and helping the environment.

The local potato industry, represented by Potatoes SA, has vocalized that, while they support GMO innovations and understand the potential of GMOs to strengthen agricultural productivity, they feel the introduction of the Bt potato at this time would negatively affect potato demand in South Africa. Potatoes SA has been focusing on increasing potato consumption in South Africa which has been falling over the past years. It is not clear if the vocalization of Potatoes SA against the timing of the approval of the Bt potato has influenced the decision of the new GMO trait. If the appeal fails there is a strong possibility that the GM potato research will cease due to lack of funding.

## **Cassava**

South Africa's Agricultural Research Council (ARC) received authorization for contained use of a starch enhanced cassava variety. The main goal of this crop is to produce an industrial starch crop, as a means to improve jobs and income for South Africa and the region. USAID/South Africa obligated \$800,000 over two years to this research and the initial focus was on further development and roll-out of a transgenic pest resistant variety of cassava for use as industrial starch. The project is being managed by Michigan State University in collaboration with the CGIAR.

## **Transgenic Sorghum**

An application for contained greenhouse facility testing of transgenic sorghum was approved by the South Africa's GMO Executive Council after twice being denied due to technical reasons. The Council for Scientific and Industrial Research (CSIR) will continue to work on the African Bio-fortified Sorghum Project (ABS) in level 3 biosafety greenhouses.

Using genetic engineering and conventional plant breeding methods, the scientists hoped to develop a more easily digestible strain of sorghum with increased levels of vitamins A and E, iron, zinc, and essential amino acids. Kenya-based Africa Harvest Biotech Foundation International will continue to lead the research.

## **Sugar**

The Variety Improvement Program of the South African Sugarcane Research Institute (SASRI) encompasses operational and research activities that facilitate the development and release of varieties with sucrose, yield, pest and disease, agronomic and milling characteristics that are desirable to both millers and growers.

The Plant Breeding Project, which forms the foundation of the program, consists of three complementary operations, viz. breeding, selection, and bulking and release, which ultimately deliver varieties adapted to the diverse agro-bioclimatic regions in the industry, while taking cognizance of the impact of pests and diseases and the needs of the milling community. The development of superior varieties is complemented by a portfolio of research projects that draw on international technological trends, both for sugarcane and other crops, to advance and refine the process of variety improvement.

Currently, modern biotechnological approaches are deployed to (1) enhance parental selection within the Plant Breeding Project, (2) deliver novel, desirable traits ('precision breeding'), (3) develop systems for the rapid bulking and distribution of high-quality seed cane and (4) investigate the biological basis of sucrose accumulation in sugarcane, with a view to enhancing the process. While these research efforts are guided strongly by breeding imperatives, they are also informed by priorities determined within the Crop Protection and Resource Optimization programs.

## **Other Research**

Research is continuing on corn and cotton for evaluation of insect resistance and/or herbicide tolerance and the long-awaited drought tolerance in corn. The ARC is also busy on transgenic virus resistant selections of an ornamental bulb species, *Orinthogalum*, a type of hyacinth (Chinkerinchee or Sun Star).

## **Pannar Seed and Pioneer Hi-Bred's Proposed Seed Partnership**

Pannar Seed (Pty) Limited, a South African-based seed company with operations throughout Africa and other parts of the world, and Pioneer Hi-Bred, one of the world's leading agricultural businesses, will participate in a Competition Tribunal public hearing in support of their request for approval of Pannar to sell a majority share of its business to Pioneer.

The public hearing, at which other parties will also make representations, is part of a process that is expected to conclude with a final hearing in September of this year. The two businesses have already submitted written representations as to why the transaction should be approved.

Pannar and Pioneer have requested the Competition Tribunal to review the December 2010 decision of the Competition Commission to prohibit the transaction. In their filing with the Tribunal, the seed businesses say that there are convincing grounds for the Competition Tribunal to approve the partnership. The transaction has already been approved by competition authorities in all other African countries - Zambia, Tanzania, Malawi, Kenya, Namibia and Swaziland – where it was required to be notified.

Pioneer intends, if the transaction is approved, to expand the two businesses' existing South African research capabilities making South Africa one of Pioneer's major research hubs outside the United States in addition to existing hubs in Brazil, China and India. The research hubs will help stimulate a transfer of skills and technology to South Africa, with benefits to farmers and consumers throughout Africa.

The partnership allows Pannar access to Pioneer's complementary plant genetics and advanced breeding technologies. By broadening its genetics base and applying new technologies to it, Pannar's ability to compete and bring new products to the market quicker would be greatly enhanced. This would help Pannar further improve its proprietary plant genetics developed over the past 50 years, which is adapted specifically for the environmental conditions farmers face in South Africa and Africa, and incorporate the most desirable characteristics into an ongoing pipeline of new competitive products.

Pannar and Pioneer say the transaction could help improve food production in South Africa and throughout Africa. The increases in farmer productivity through higher crop yields and better use of technology are a critical component in addressing the need to feed rapidly increasing populations, in Africa and globally.

### **Section III. Plant Biotechnology Policy:**

## **Historical context**

Already in 1979, the South African government established the Committee on Genetic engineering (SAGENE). SAGENE comprised of a group of brilliant South African scientist and was commissioned to act as scientific advisory body to the government and pave the way for the uptake of genetic engineering in food, agriculture, and medicine. In 1989, on the advice of SAGENE, the first GMO experiments in open field trails took place. In January 1994, a few months before South Africa's first democratic elections, SAGENE was given legal powers to "advise any Minister, statutory or government body on any form of legislation or controls pertaining to the importation and/or release of GMO products". As a result, SAGENE was task in drafting a GMO Act for South Africa. A draft GMO bill was published for public comment in 1996 and passed by the Parliament in 1997. Nevertheless, the GMO Act only came into effect in December 1999, after regulations to bring the Act into effect were promulgated. In this interim period, SAGENE continued to act as the key "regulatory body" for GMO products, and under its auspices granted permits to allow Monsanto commercializing GM cotton and GM corn seed. In addition, 178 permits were granted for a variety of open field GMO trails. Once the GMO Act came into effect, SAGENE ceased to exist and was replace by an Executive Council, established by the GMO Act.

## **The GMO Act of 1997**

The GMO Act of 1997 and its accompanying Regulations are administrated by the Department of Agriculture, Forestry and Fisheries (DAFF) as the principal pieces of legislation to regulate GMOs in South Africa. Under the GMO act a decision-making body (the Executive Council), an advisory body (the Advisory Council) and administrative body (the GMO Registrar) was established to:

- Provide measures to promote the responsible development, production, use and application of GMOs;
- Ensure that all activities involving the use of GMOs be carried out in such away as to limit possible harmful consequences to the environment, human as well as animal health;
- Give attention to the prevention of accidents and the effective management of waste;
- Establish mutual measures for the evolution and reduction of the potential risks arising from activities involving the use of GMOs;
- Lay down the necessary requirements and criteria for risk assessments;
- Establish appropriate procedures for the notification of specific activities involving the use of GMOs.

This GMO Act of 1997 was modified by cabinet in 2005 to bring it in line with the Cartagena Biosafety Protocol (CBP) and again in 2006 in order to address some economic and environmental concerns. These amendments to the GMO Act were published and gazetted on April 17, 2007 and came into effect in February 2010 after the Regulations were published. The GMO Act as amended does not change the pre-existing preamble, which establishes the general ethos of the legislation namely, to subsume the need for biosafety with the imperative to promote genetic engineering.

The amendments to the GMO act know make it clear that a scientifically based risk assessment is a prerequisite for decision-making and also authorizes the Executive Council (EC) to determine if an

environmental impact assessment is required under the National Environmental Management Act. The amendments also add specific legislation to allow socio-economic considerations to factor into decision making and makes those considerations significantly important in the decision making process.

The amendments also create at least 8 new provisions dealing with accidents and/or unintentional transboundary movement. These provisions have been motivated by the spate of contamination incidents that have occurred worldwide involving unapproved GMOs. A new definition of “accident” has been created to capture two types of situations: one dealing with unintentional transboundary movements of GMOs and the other, unintentional environmental release within South Africa.

In summary: The existence and application of the GMO Act and its amendments provides South Africa with a decision-making tool that enables authorities to conduct scientifically-based, case-by-case assessment of the potential risks that may arise from any activity involving a particular GMO.

### **The Executive Council**

The EC functions as an advisory body to the Minister of Agriculture, Forestry and Fisheries on matters relating to GMOs, but more important is the decision-making body that approves or rejects GMO applications. The EC is also empowered to co-opt any person knowledgeable in the field of science to serve on the EC to provide advice.

The EC is made up of representatives of different departments within the South African government. These include:

- Department of Agriculture, Forestry and Fisheries
- Department of Water and Environmental Affairs
- Department of Health
- Department of Trade and Industry
- Department of Science and Technology
- Department of Labor
- Department of Arts and Culture

Before making a decision regarding GMO applications, the EC is obliged to consult with the Advisory Committee (AC). The AC is represented on the EC by its chairperson. Decision-making by the EC is on the basis of consensus by all the members and where no consensus is reached, the application before the EC will be considered as having been refused. For this reason it is essential that all representatives on the EC have significant knowledge on biotechnology and biosafety.

### **The Advisory Council**

The AC consists of ten scientists who are appointed by the Minister of Agriculture, Forestry and Fisheries. The EC has a say in the appointment of members of the AC and has recently changed a number of its members, following protest by civil society that some members of the AC, many of them ex-SAGENE members, were also members of the pro-GMO lobby group, Africabio.

The role of the AC is to provide the EC advice on GMO applications. The AC is further supported by subcommittee members representing an extended pool of scientific expertise from various disciplines. The AC together with the subcommittee members is responsible for the evaluation of risk assessments



of all applications as it relates to food, feed and environmental impact and submit recommendations to the EC.

### **The Registrar**

The Registrar, who is appointed by the Minister of Agriculture, Forestry and Fisheries, is in charge of the day-to-day administration of the GMO act. The Registrar acts on the instructions and conditions laid down by the EC. The Registrar is also responsible for examine applications to ensure conformity with the Act, issuing of permits, amending and withdrawing of permits, maintaining a register and monitor all facilities that are used for contained use and trail release sites.

### **Other regulations that impact on GMOs in South Africa**

### **The National Environmental Management Biodiversity Act**

The National Environmental Management Biodiversity Act (Biodiversity Act) of 2004 was established to protect South Africa's biodiversity from specific threats and includes GMOs as one as those threats. It also ensures there is a sharing of benefits from South Africa's biological resources.

Section 78 of the act gives the Minister of Environmental Affairs the power to deny a permit for general or trial release applied for under the GMO Act, if the GMO may pose a threat to any indigenous species or the environment, unless an environmental assessment has been conducted. There have been relatively few GMO environmental assessments conducted as a result of the requirements of the Biodiversity Act.

The Act also asks for the establishment of a South African Biodiversity Institute (SANBI). SANBI is tasked to monitor and report regularly to the Minister of Environmental Affairs on the impacts of any genetically modified organism that has been released into the environment. The legislation requires reports on the impact of non-target organisms and ecological processes, indigenous biological resources and the biological diversity of species used for agriculture.

### **Consumer Protection Act**

Health regulations published in 2004 largely follow Codex Alimentarius scientific guidelines. They mandate labeling of GM foods only in certain cases, including when allergens or human/animal proteins are present, and when a GM food product differs significantly from a non-GM equivalent. The rules also require validation of enhanced-characteristic (e.g., "more nutritious") claims for GM food products. The regulations do not address claims that products are GM-free.

On April 24, 2009, the President signed the new Consumer Protection Bill into law. Implementation of the Act, however, was delayed for some time as the legislation generated significant comments from the private sector over the basis of many provisions and uncertainty in how the Act would be enforced. The new Consumer Protection Bill require virtually that every product label in South Africa's food and beverage industry to be changed.

On April 1, 2011, the South African Department of Trade and Industry (DTI) published regulations in the Gazette that brought the Consumer Protection Act (68/2008) into enforcement. The regulation will come into effect six months after the commencement of the act. The primary purpose of the law is to prevent exploitation or harm of consumers and to promote the social well being of consumers.

However, the approved Consumer Protection Act has the following section which states that all products containing GM material must be labeled [Section 24(6)]:

*(6) 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.*

According to the act:

- All food containing more than five percent genetically modified ingredients, whether produced in South Africa or elsewhere, needs to carry the declaration which states, "contains at least five percent genetically modified organisms" in a conspicuous and easily legible manner and size.
- Those products that contain less than five percent of genetically modified organisms (GMOs) may be labeled "Genetically modified content is below five percent".
- If it is impossible or not feasible to test goods for the presence of GMOs, the product must be labeled "may contain GMO ingredients".
- Less than one percent – maybe labeled as does not contain genetically modified organisms

Thus, mandatory labeling of GMOs is required for all domestic and imported food products. The Department of Trade & Industry views the labeling of GMOs solely within the context of the consumers right to obtain the facts needed to make an informed choice or decision about food. It is thus not about human health, safety or quality issues.

Additionally, the new Act includes a significant change to product liability, where a consumer no longer has to demonstrate that a producer was negligent before receiving compensation for injury. The new legislation puts the burden of proof on the producer or supplier, meaning that a consumer can sue almost any producer or supplier for harm or injury that is the result of a failed, defective, or unsafe product. Almost every supplier must comply with the bill, even if the supplier does not reside in South Africa. Foreign producers who sell products through a South African agent for use in South Africa would be included under the bill.

These regulations may have a significant impact not only on regional trade, but also on United States exports to South Africa, since all products will have to be labeled and producers/suppliers could be held liable for any purported harm their product may have caused. South African biotechnology stakeholders are also concerned about the scope of the clause and whether GM products that have already been registered and approved for use in the Republic of South Africa (e.g. certain varieties of corn, soybean and cotton) need to be labeled.

South Africa is seen as a leader in the biotechnology front in Africa, and many neighboring countries look to South Africa for guidance and direction. While South Africa is an ally of the United States in that it has a progressive biosafety policy that is based on sound science and backed by an informed, forward-thinking GMO Council and Advisory Committee, this is an instance where uneducated parties can introduce legislation that will affect the administration of the current GMO biosafety legislation. As other countries look to South Africa for guidance, they may be likely to adopt similar legislations that would affect trade.

## **Biosafety Protocol**

SA has signed and ratified the Cartagena Protocol on Biosafety (CPB). The primary responsibility for implementing the CPB has shifted from the Department of Environmental Affairs to the Department of Agriculture, Fisheries and Forestry (DAFF). CPB implementation is meant to be gradual, and accordingly DAFF's implementation will be in phases, with the most significant issues being handled first. SA, under the leadership of DAFF's GMO Regulatory Office, has modified its GMO Act to comply with the CPB. The CPB will likely slow down trade with its additional bureaucratic requirements but will likely not diminish trade in GMOs in the long run.

## **The regulatory treatment of Stacked Events**

SA requires an additional approval for a plant that combines two already approved traits, such as herbicide tolerance and insect resistance. This requirement means that companies effectively need to start from the beginning of the approval process for stacked events, even when the individual traits have already been approved.

In October 2005 Monsanto received DAFF approval to launch stacked-gene cotton in South Africa. The seed combines an insecticide with a built-in resistance to weed-killer. The stacked-gene variety was created using conventional breeding techniques in which hybrid cotton was created by crossing insect-resistant plants with herbicide-tolerant ones.

In March 2007 Monsanto SA received "general release" permit clearance for Mon 810 x NK 603. Monsanto decided to market the stacked corn product in South Africa after the farmers' positive response to the cotton stacked gene seed.

## **The regulatory treatment of coexistence**

Coexistence has not been an issue that has necessitated the introduction of specific guidelines or regulations in South Africa. The government leaves the management of the approved GM field crops to the farmers. South Africa also does not currently have a National Organics Standard in place.

## **Technology Fees**

Biotechnology companies operating in South Africa follow essentially the same procedure for collecting technology fees that they follow in America. This policy generally works because South Africa is a signatory to the Trade-Related Aspects of International Property Rights (TRIPS) agreement of the WTO. Trade sources relate that cotton and corn are such that farmers have to buy new seed every year. Farmers sign a one-year licensing agreement, and the technology fee is included in the price of the bag of seed for these crops. Soybeans are more difficult. Technology developers try to collect the fee from the farmers when they deliver the harvest to the terminal. This fee can be difficult to collect because soybeans are open pollinated so seed need not be purchased each year. Also farmers often use soybeans for feed right on the farm so they might never enter commercial circulation. This challenge is not unique to South Africa, but rather is due to the intrinsic nature of the soybean.

## **Permit fees**

Under the GMO Act the GMO registrar charge a fee for the different permits that can be issued. Table

7 illustrates the current permit fees payable.

**Table 7: Permit fees payable**

<b>Application</b>	<b>Fees</b>
GMO status certificates	R170 (\$25)
Importation or exportation of GMO with general release status	R400 each (\$59)
Contained use GMO's	R1,180 (\$174)
Trial release of GMO's	R2,800 (\$412)
General release of commodity clearance of GMO's	R21,800 (\$3,205)
Appeal	R4,280 (\$630)
Extension permit	R350 (\$52)
Registration of facility	R410 (\$60)
Commodity use permit	R240 (\$35)

#### **Section IV. Plant Biotechnology Marketing Issues:**

##### **Producers, Seed Companies, and Importers**

South African farmers can be divided into two categories; commercial and subsistence farmers. GM products have a wide appeal with both groups. Each group appreciates that GM crops use fewer inputs and have higher yields. In fact, subsistence farmers find some GM crops easier to manage than

traditional or hybrid varieties.

Seed companies have found that subsistence growers are an important market for GM crops. Distributors should be from the local area, speak the local language, and they should take time to talk with people and explain the technology and its benefits. When this care is taken, small-scale growers are generally receptive to new technologies.

Importers require assurance that no unapproved GM varieties are inadvertently contained in the shipment because South Africa's regulation for adventitious presence is only one percent. Yet, in reality their tolerance is zero, since the GMO Registrar's office won't grant an import approval for a shipment coming from a country that cultivates events that aren't approved in South Africa; if the product is milled or otherwise processed it can usually enter.

### **Consumers**

A survey conducted by the Department of Science and Technology's Public Understanding of Biotech organization, shows that most South Africans have no knowledge of biotechnology. This finding is not surprising given that most South Africans are more concerned with the price of food than with how it was grown. What is interesting is that despite this lack of understanding, an average of 57 percent indicated that different applications of biotechnology should continue.

Although South African scientists are among their continent's leaders in biotechnology, the survey showed that the term "biotechnology" means nothing to 82 percent of the general public. A similar proportion is unaware of the meanings of 'genetic engineering', 'genetic modification', and 'cloning'. The study, in which researchers interviewed 7,000 people in the language of the participant's choice, was designed to be representative of the adult population of South Africa. It reveals that even among the few South Africans who were aware of biotechnology, most were indifferent to it.

When asked who they most trust to tell the truth about biotechnology, 24 percent of interviewees said universities, 19 percent said the media, and 16 percent said the government. Respondents were even less likely to trust consumer groups, environmental organizations, religious groups, or the biotechnology industry. The survey concluded that South Africa needs better science communication about biotechnology so that people can have a clearer picture of how it affects their lives.

### **Section V. Plant Biotechnology Capacity Building and Outreach:**

The South African government generally supports the use of biotechnology products. Transgenic varieties of cotton, corn, and soybeans are approved for commercial planting and almost 77 percent of corn plantings, 85 percent of soybean plantings and all cotton plantings in South Africa are GM. Agricultural biotechnology holds wide appeal for South African small and commercial farmers as they recognize the financial benefits of fewer inputs and potentially higher yields.

FAS/Pretoria's program uses South Africa as an example of a country that accepts and uses agricultural biotechnology successfully when doing outreach activities in the region. South Africa's GMO adoption story is key in FAS/Pretoria's regional biotechnology strategy. The participation of South African researchers, officials, and experts in USDA funded outreach activities as speakers and participants, adds a type of credibility to the biotechnology picture that the U.S. story alone could not attain. To continue to strengthen the South African agricultural biotechnology position by implementing a sustained and deliberate outreach strategy will contribute significantly to harmonizing the regional biotechnology system and lead to less trade disruptions overall.

FAS/Pretoria's short term goals for biotechnology in Southern Africa include:

- Stakeholders in southern Africa have the capacity and understanding of agricultural biotechnology necessary to propose science-based regulations.
- Regulators in South Africa approve for use a local or regionally developed biotechnology event, for example the potato or banana.
- As part of the Global Hunger and Food Security Initiative (Feed the Future), U.S. and South African regulators and companies work with other countries in southern Africa to build support for science-based biotechnology regulations.

Below, the activities that have been carried out by FAS/Pretoria in the region since 2008 are listed. These activities are implemented usually through AfricaBio. AfricaBio is a non-governmental, non-political and non-profit biotechnology organization based in South Africa that advocates for stakeholders in the research and development, production, processing and consuming sectors. The bulk of its funding comes from the private sector. USAID and other U.S. organizations provide periodic funding for training and capacity building activities and production of biotechnology informational materials.

**Biotechnology and biosafety workshops (August 20 – 27, 2008):** Dr. C.S. Prakash, Professor of Plant Molecular Genetics, Tuskegee University, and Dr. Martin Lema, Advisor to the Argentine Ministry of Agriculture and Professor of Biotechnology, Quilmes University, travelled to Madagascar and Mozambique to lead two agricultural biotechnology and biosafety workshops sponsored by the USDA and the Governments of Mozambique and Madagascar. These conferences were funded through FAS/EMP and State/EB.

**Visits from EPA and APHIS (September 15 – 19, 2008):** Dr. Chris Wozniak, Biotechnology Special Assistant, U.S. Environmental Protection Agency (EPA), and Dr. Robyn Rose, USDA/Animal Plant Health Inspection Service (APHIS) were in South Africa for two one-day presentations to new members of the South African GMO Advisory committees and subcommittees as well as presentations at the Bio2Biz biotechnology forum sponsored by the South African Department of Science and Technology and presentations at the International Centre for Genetic Engineering and Biotechnology's (ICGEB) Biosafety course. These trips were funded by FAS/EMP and State/EB.

**Technical assistance (September 26 – 28, 2008):** Dr. Eugenia Barros, Biotechnologist, AfricaBio, travelled to Mozambique to provide technical assistance to the Mozambican government on

implementation procedures for their biosafety policy and to present on acceptance of biotechnology in an EU-sponsored conference. Her travel to Mozambique was funded by FAS/EMP.

**Regional workshop biosafety regulations (May 10 – 13, 2009):** FAS sponsored a regional workshop in South Africa for representatives from Mauritius, Mozambique and Zimbabwe to discuss regional issues surrounding biosafety regulations and trade effects. This workshop was funded by PASA/OCBD. The objective of this workshop was to develop capacity and expertise in biotechnology/biosafety regulation, to include food safety regulations, so that the delegates will be able to implement and enforce the relevant legislation and so create an enabling environment for biotechnology to thrive in their countries. The Workshop was facilitated by the United States Department of Agriculture (USDA) and organized by AfricaBio.

The workshop was attended by a total of 25 delegates. Participants included senior regulatory scientists, especially those involved in biosafety regulatory system in their various countries, stakeholders and representatives from relevant government departments. Interactive sessions with various biotechnology and biosafety experts and government departments were facilitated during the discussions.

Delegates were given opportunities to gather information in the form of presentations, discussions, laboratory visit, field visits and one-on-one interactions. They were able to hear from multiple perspectives the various strategies and tools the South African government has developed and are implementing to harness the benefits of biotechnology while utilizing its various safety channels to minimize risks.

**Biotech study tour to the United States (November 6 – 20, 2009):** OAA/Pretoria received funding to conduct a biotech tour of the United States for representatives from Mauritius (2), Mozambique (3), and South Africa (6). The group included three government officials from the South African Department of Agriculture, Forestry and Fisheries (DAFF), including the current acting Director-General in DAFF, one government official from the Department of Science and Technology in Mozambique, one representative each from the grain and potato industries in South Africa, two researchers from Mauritius and one from Mozambique and two persons from the media.

The three-country delegation brought opportunities for the participants to share ideas, exchange opinions, and start a dialogue on biotechnology issues in Southern Africa.

Meetings and informational sessions included in Washington, DC: APHIS, EPA, FDA, USDA/Ag Research Service, USDA/Foreign Agricultural Service, GIPSA, Biotech Industries Org., ILSI, among others;

and in St. Louis, Missouri: Danforth Plant Center, Monsanto, American Soybean Association, Universities, farm media, and river logistic companies.

**Adventitious presence workshop (May, 26, 2010):** FAS/Pretoria in collaboration with AfricaBio, held a two part workshop on Adventitious Presence in Pretoria, South Africa. The workshop formed part of a study prepared by the National Advisory Council of Innovation on “Adventitious Presence of GMOs in commodities”. The National Biotechnology Advisory Committee commissioned the study following approval of the Consumer Protection Act. The purpose of the study is:

- To increase understanding of regulators, scientists and industry about the requirement for labeling.

- To determine how this should be done and who would bear the cost.
- To determine the level of engagement between regulators, scientists and members of the industry.

In total, 26 stakeholders participated in the workshop: government departments, seed companies, Grain trade organizations, Silo Association, Public research institutions etc.

The greatest success of the workshop came when the Director: Consumer and Competition Policy & Law Department of Trade and Industry presented on the reasoning behind the new Consumer Protection Act and the steps that have been taken by his office towards the implementation of the Act. His office directly influences how the act will be implemented. At the beginning of the workshop, the Director was in favor of mandatory labeling, arguing the consumer has a right to know in order to take steps to protect their health. By the end of the workshop, he acknowledged the impact of his position, and demonstrated a genuine understanding of the implications of the proposed labeling requirement.

After the presentations and lunch, the attendees were divided in break-away groups to discuss the best solution for South Africa regarding adventitious presence. The following is a summary of the outcomes of these discussions:

- It was agreed that as more and more countries started growing GM crops and as the global area under cultivation increased the chances of commingling increased. In the same way the non-GM niche market would continue to grow and people and businesses that required non-GM products would have to pay a premium.
- Participants felt that the recently approved SA Consumer Protection Act that required the mandatory labeling of all GM products needed further discussion and this issue also had a bearing on the handling of Adventitious Presence. Both subjects should reflect of South Africa's overall stance on GMOs and the risk associated with their commingling with non-GM products.
- The mandatory labeling of all GM products as required by the Consumer Protection Act was unnecessary and that the Department of Health's Regulation No. 25 adequately covered the subject.
- Should the Act be applied without further alteration then use of the term "May contain" should be permitted for all products containing more than 1% adventitious presence of GMOs.
- It was essential that the government departments directly involved with GMOs (Agriculture, Environment, Health, Trade & Industry and Science & Technology) make a greater effort to communicate more effectively with one another.
- For those consumers wanting to choose non-GM products, a "non-GM" label should be permitted and this would be based on a chemical analysis of the product to verify that it did not contain novel DNA or a novel protein. The cost of this procedure should be borne by those consumers wishing to choose this option.
- Concern was expressed about product recalls and product claims.

The presentations and discussion at the workshop demonstrated the value and implications of the need



for greater dialogue between the various government departments and the major stakeholders. There is a need to introduce a proactive policy options for adventitious presence that will maintain the uninterrupted flow of trade of agricultural biotech products between South Africa and other countries

**Biotech study tour to the United States (October 31 – November 16, 2010):** FAS/Pretoria partnered with Cornell University to organize a tour for six key regulatory officials from Angola, Mozambique, and South Africa on agricultural biotechnology research, regulation, and commercial application in the United States. The tour built on Post's ongoing efforts to encourage the adoption of commercial agricultural biotech practices, the adoption of science based systems, and to ensure the uninterrupted flow of trade to the region by consistently engaging lawmakers and regulatory officials. The tour was made possible by a grant from the USDA's Emerging Markets Program (EMP).

FAS/Pretoria worked closely with counterparts at South Africa's Department of Agriculture, Forestry, and Fisheries (DAFF), as well as the South African Genetically Modified Organism (GMO) Council, and officials in Mozambique and Angola to develop and tailor a program that met both the needs of the participants and the USDA's strategic objectives in the region. Implementing recommendations from previous assessment of biotechnology outreach efforts conducted using EMP funding in FY09, FAS/Pretoria expanded the agenda beyond commercial applications of biotechnology in agriculture to include a substantial focus on the U.S. regulatory system with the aim of positively influencing regulatory systems in the region. The tour participants are responsible for advising, improving, or creating a regulatory framework or law for biotechnology in their countries and were interested in learning how they could incorporate certain components of the U.S. system into their regulations. FAS' facilitation of their engagement with U.S. regulatory officials and commercial producers in technical discussions will prove invaluable as the participants develop their respective regulatory processes.

The participants began their tour discussing the scientific underpinnings and cutting edge research in the field with leading biotechnology researchers at Cornell University, followed by candid exchanges with U.S. regulatory officials at the Environmental Protection Agency (EPA), USDA, and Food and Drug Administration (FDA) in Washington, D.C. The second week of the tour found the participants in Missouri and Iowa where commercial farmers, seed companies Monsanto and Pioneer, USDA Cooperators, and plant breeders at the Danforth Plant Science Center engaged the participants on the commercial applications of agricultural biotechnology with particular focus on the regulatory process and how it impacts research and production.

The feedback from the participants, organizers, and speakers was overwhelmingly positive and multi-faceted. The participants had well-structured and lively discussions with scientists, regulators, technology providers and technology users. Equally important, the participants, all representing African countries at different stages of adoption of biotechnology, were able to share their experiences and plans. Three of the five regulatory officials hold adjunct or full professor positions in the area of agricultural biotechnology research in various universities.

In addition to the stated objectives of the tour, other concrete benefits took place. For example, participants learned about Cornell University's Transnational Learning Program for the Department of Plant Breeding and Genetics. This involves the development of workshops, short courses and full MSc/PHD training curricula for training plant breeders in traditional breeding methods and application of new molecular technologies to applied breeding programs. This program is highly active in Africa and future collaborations were discussed. Additionally, participants learned of Cornell's The Essential

Electronic Agricultural Library (TEEAL) program to further the exchange of information in science. FAS/Pretoria will work with Cornell University to assist universities in South Africa, Mozambique, and Angola in obtaining access to 150 agricultural journals in TEEAL valued at an estimated \$2 million for a nominal fee of \$5,000 to 10,000. Access to the journals will further the dissemination and exchange of science to universities and regulators in Southern Africa.

Another concrete highlight of the program was the increased knowledge and help offered to Mozambique as it prepares to hold its first field trials of drought tolerant corn in 2011. In depth discussions with Crop Life International and the Program for Biosafety Systems of the International Food Policy Research Institute provided guidance and offers of help to assist in this important trial.

**U.S. Science envoy Dr. Gebisa Ejeta (May 16-21, 2011):** A key component of Dr. Ejeta's engagement in South Africa was on agricultural biotechnology. Post, in collaboration with AfricaBio, organized a business brunch for Dr. Ejeta with local members of the agricultural biotech community. Dr. Ejeta gave a well received presentation on "Understanding the challenges and opportunities for applying science and food production" highlighting three key ingredients for sustainable economic development, namely, science and technology, human and institutional capacity building and good policy and governance.

**Assistant Secretary Fernandez (June 7, 2011):** Post organized a breakfast meeting for A/S Fernandez with members of the Agricultural Business Chamber (ABC) of South Africa. The ABC is a private organization representing agribusinesses in South Africa. Biotechnology was one of the items on the agenda and the agribusinesses present reiterated the importance of this science in combating food insecurity in Southern Africa. Post also introduced A/S Fernandez to AfricaBio in a very positive lunch meeting.

**OECD Conference on Agricultural Knowledge Systems (June 15 – 17, 2011):** Post collaborated with FAS Paris to send a commercial farmer from South Africa to the OECD conference to deliver a keynote address. Unfortunately, due to logistical problems he was unable to attend but his paper titled "Farmers' Experience with Biotech Crops in South Africa" was read by at the meeting and well received.

**Food and Environmental Safety Assessment of Genetically Engineered Animals (September 5 – 9, 2011):** Post is collaborating with FAS/Washington to send a participant from Biosafety South Africa to the above-mentioned workshop to be held in Buenos Aires. The workshop is sponsored by the International Centre for Genetic Engineering and Biotechnology and the United Nations University-Program for Biotechnology in Latin America and the Caribbean.

**Plant Biotechnology: Environment, Food, Health. What Future? Conference (September 19 – 21, 2011):** Post is again collaborating with FAS/Paris to identify a farmer from South Africa to participate as a speaker at above-mentioned conference. The French association for Plant Biotechnology (AFBV) is organizing the conference.

### **Country Specific Needs**

Regulatory stabilization and streamlining should be a focal point to capacity building activities in South Africa. These activities could include:

- Regular interaction and information exchange with regulators on GMOs,
- Interactions with portfolio committees in parliament, and;

- Regular interaction one on one with chair persons of committees.

There is also a continued need for biotechnology capacity building in the EC and, to a lesser extent, AC and their superiors and supporting personnel. Some members of the EC are hindered in their decisions by the desires of their superiors, while others may have no involvement of their superiors in their decisions expressed in the EC, and thereby could be characterized as 'loose-cannons'. Increasing awareness at all levels of the departments and ministries represented on the EC could lead to better, more sound decision making.

Additionally, outreach to small scale farmers on the benefits of biotechnology, specifically Bt corn should also be a focus. Expanding this outreach to include consumer groups and the general public could achieve greater understanding and acceptance of biotechnology.

## **Section VI. Animal Biotechnology:**

Animal biotechnology also falls under the GMO Act of 1997 and any application will have to be approved by the EC. However, no animal biotechnology is at this stage conducted in South Africa. The Directorate of Biosafety in DAFF is proactive and is in the process of developing a framework for risk assessments regarding animal biotechnology.