


The Role of Biotechnology to Enhance Agricultural Productivity, Production and Farmer Incomes.

SACAU Policy Conference
16-17 May 2011



Enock Chikava
AFSTA President

Agenda

1. AFSTA and position on Biotechnology.
2. Challenges of Food Production.
3. Misconceptions about Biotech.
4. Global Biotechnology Momentum.
5. Impact of Biotechnology.
 - Global.
 - Africa.
6. Future Biotech Traits
7. Conclusions/Recommendations

Africa Seed Trade Association

Contributing towards sustainable agricultural development through the widespread use of high quality seed technologies and traits in Africa.

Membership

- 26 National Seed Trade Associations.
- 38 Seed companies (local, regional and multinational).
- Associate members from France, USA, India, Asia.
- NGOs

AFSTA's Position on Biotechnology:

“Modern Biotechnology *offers important options* in meeting food demand and environmental challenges, particularly where traditional breeding techniques have not been able to solve these specific problems. By means of Modern Biotechnology, Africa will be able to develop and use superior varieties that can perform under *severe biotic and abiotic stresses* that are detrimental to African agriculture”.

Challenges of Food Production

Global challenges embodied in the UN Millennium Development Goals (MDGs) require relentless *innovation* and *collaboration* of all stakeholders.



By 2025, 1ha must feed 5 people compared to 2 people in 1960 . 70% more food by 2050 (WB, 2010).

9 Billion people (mouths) by 2050:

- Africa's urban population expected to be 40% by 2030.
 - Diminishing Ag labour force from 70% to 50% by 2020.
- SSA per capita maize consumption @ 250 – 270kg.

Food price increases and volatility to continue into the next decade.

- Declining stocks.
- Poor harvests.
- Growing demand, 2.5X increase in demand by 2050.

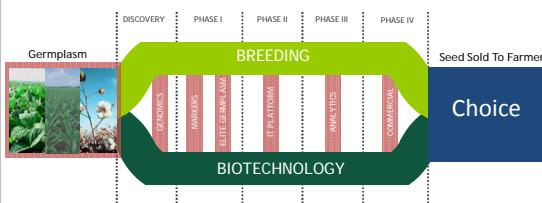
Land and water resources dwindling:

- 50% of current arable land will become unusable by 2050.
- Agriculture uses more than 70% of freshwater, which is scarcer.

Climate change affecting agriculture.

- Droughts and water scarcity.
- Floods and land degradation.
- Pest prevalence.
- Soil salinity. Carbon emission.

Delivering a higher-yielding seed



Our work is aimed at *maximizing, protecting and enhancing yield* – so that farmers can get more out of each seed. More out of each seed means more profitability, or a way to meet on farm needs, or a new way to diversify their farming operations.

Misconceptions about Biotechnology

Because the science behind biotech is complex, misconceptions arise over its impact and implications.

Myth 1: GM Crops are not safe:

Facts: Crops improved through biotechnology have undergone more safety and environmental testing than any crop varieties in history, and have been produced and consumed by humans and animals in millions of tons around the world for years. They have been proven as safe as the scientific method permits, by every valid method known to science and medicine. There is, to date, not a single solitary confirmed case of human or animal illness or disease associated with a biotech crop.

Myth 2: GM Crops failed to deliver the promised benefits:

Facts: Crops improved through biotechnology enjoy farmer satisfaction levels in the high 90% ranges, and these new varieties have penetrated the market at unprecedented rates, never seen in agriculture. The reasons are very simple, they add tremendous value!

Myth 3: GM technology is in the hands of multinationals and this will result in centralised control of the seed industry.

Facts: While the investment in biotechnology is very high, with combined cost of \$3-4M/day in R&D, competition is never at traits level, but product quality and service. Biotech companies have a broad licensing strategy that allows seed companies with capacity to produce and market biotech traits do so. Farmers have the choice of the technologies and the germplasm/brands to use and should not be stuck to one or a few giants. Public research and universities in Asia are at the fore front of biotechnology development.

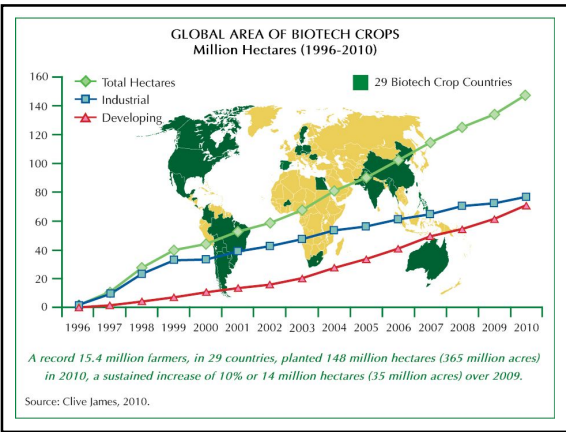
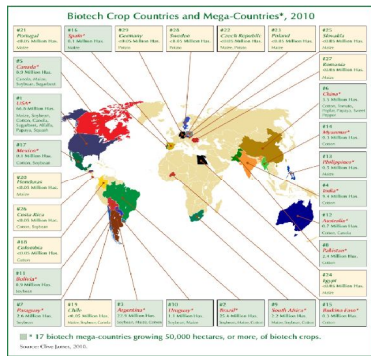


Global Biotechnology Momentum

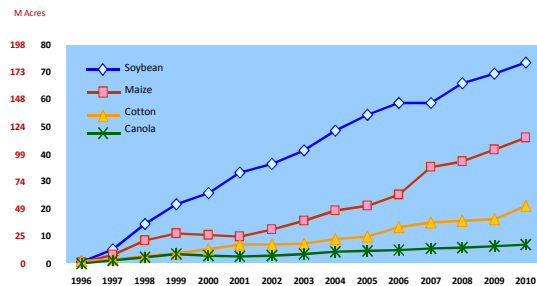
In the 15 years (1996-2010) of biotech crops planting, there is incredible data pointing to the value of this technology.

- There has been an 87-fold increase in hectareage since 1st planting.
 - ✓ Cumulatively more than 1Billion ha.
- 148M ha in 2010, a 10% increase above 2009.
 - 29 countries planted biotech in 2010, up from 25 in 2009.
 - ✓ 19 countries of these are developing and 10 developed.
 - ✓ 3 new countries planted for the 1st time in 2010.
 - ✓ 10 countries planted more than 1M ha.
 - ✓ 50% of the world population live in these 29 countries.
 - 15.4M farmers grew biotech crops in 2010, 90% of which are smallholder.
- 59 countries approved the use of biotech crops in 2010.
 - ✓ 29 countries for planting.
 - ✓ 30 countries importing approvals.
 - ✓ 75% of the World population lives in the 59 countries.

Biotech Crop Countries and Mega-Countries, 2010

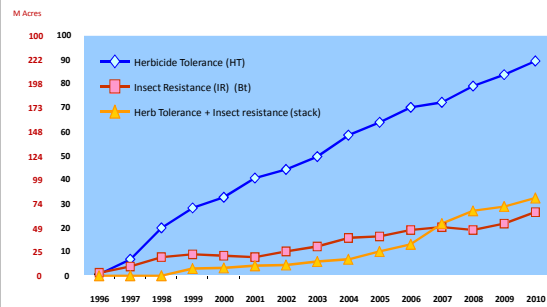


Global Area of Biotech Crops, 1996 to 2010: By Crop (Million Hectares, Million Acres)

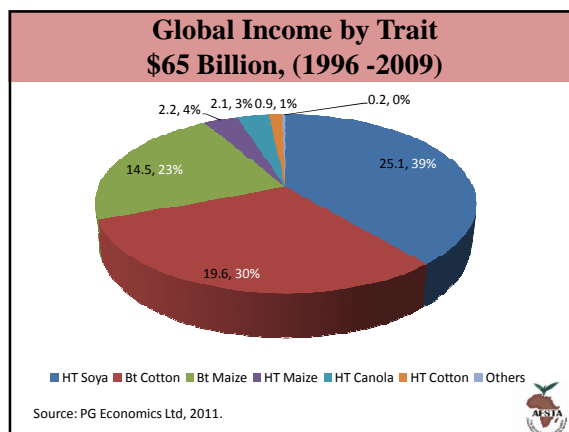
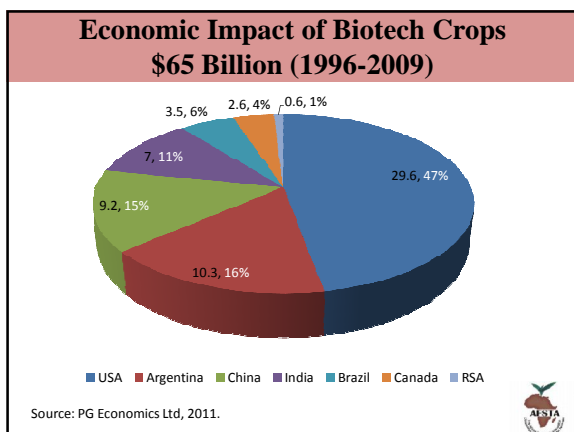
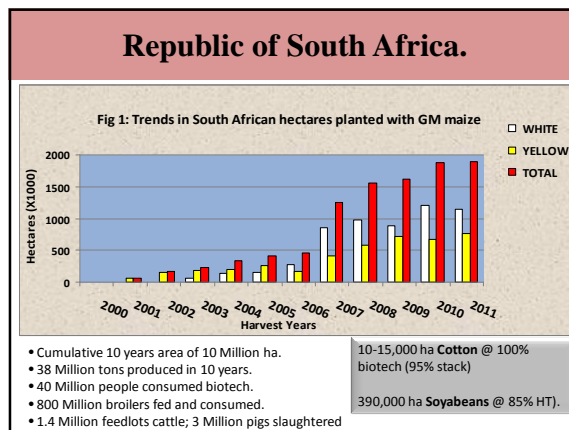
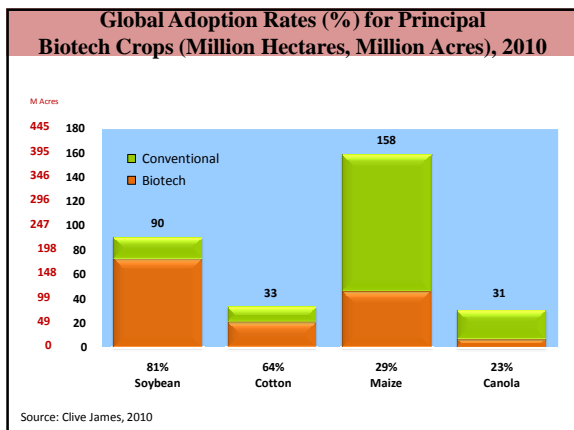


Source: Clive James, 2010

Global Area of Biotech Crops, 1996 to 2010: By Trait (Million Hectares, Million Acres)



Source: Clive James, 2010



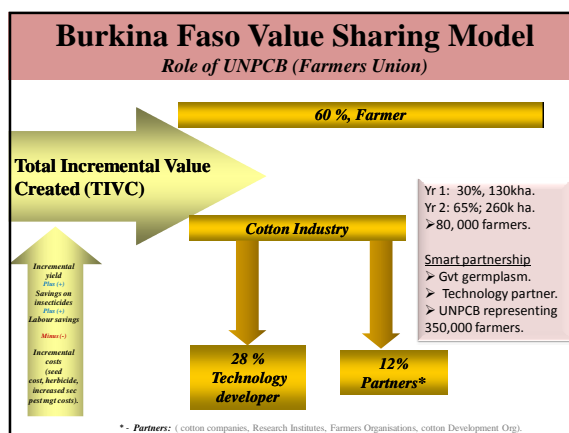
Economic Benefits

At Farmer Level.

- 50 – 65% cost reduction.
- 15 – 25% productivity increase.

Economic Values:

- Increasing crop production > \$65 Billion (1996-2009).
- Pesticide reduction > 393M kg of active ingredient (ai).
- Reduction in Carbon dioxide emission by 18 Billion kg, equivalent to 8Million cars off the roads.



Future Biotech Traits

- Drought tolerant maize, 2012 in the USA and 2016 in Africa (WEMA).
- Biotech wheat with drought tolerance, disease resistance and grain quality.
- Biotech potatoes (2015) resistant to late blight
- Sugar cane with improved agronomic and quality traits
- Disease resistant bananas
- Bt eggplant, tomato, broccoli, cabbage, cassava and sweet potato
- Golden rice with pro-Vitamin A.

Drought is a big issue!

Maize faces myriad: Drought the most damaging

Major Causes of Corn Crop Losses, 1948-1992

Cause	Percentage
EXCESS MOISTURE	10%
FROST/FREEZE	8%
HAIL	7%
FLOOD	3%
WIND	2%
OTHER	1%
DISEASE	1%
INSECTS	1%
DROUGHT	67%

- Corn uses about a third-of-an-inch of water every day during pollination
- Four days of visible wilting between boot and milk can reduce yield by half
- Between the end of vegetative growth and soft dough, corn requires about 7 inches of water

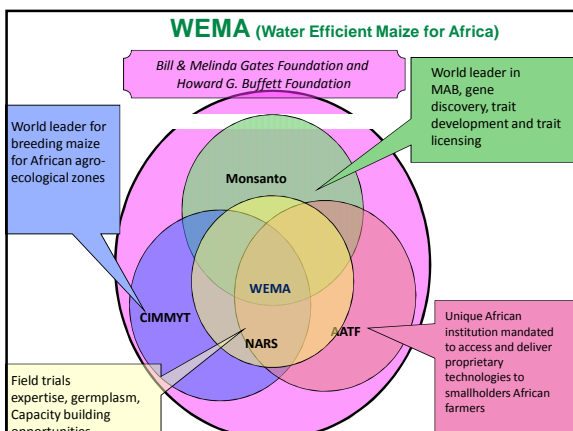
Conclusions/Recommendations

Biotechnology has, to date, delivered several specific *agronomic traits* that have overcome a number of *production constraints* for many *farmers*. This has resulted in improved *productivity* and *profitability* for the **15.4 million adopting farmers** who have applied the technology, to **148 million hectares** in 2010. During the last fifteen years, this technology has made important positive socio-economic and environmental contributions.

Recommendations:

1. SACAU to assist in the development of appropriate policies and programs to foster rapid development in agricultural biotechnology.
2. SACAU to continue encouraging discussion and information sharing amongst a cross-section of stakeholders towards building an understanding for Modern Biotechnology.
3. SACAU to consider active involvement in WEMA.

Backup Slides

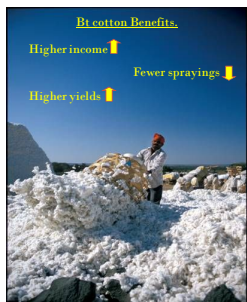


Biotech Benefits Large and Small Holder Farmers

Biotech Experience

- 148 M hectares planted in 2010.
- 15.4 M farmers, of which ~14.4 million are smallholders in developing countries
- 29 countries
- over 1 trillion meals
- No confirmed health issues

Improved livelihood for farmers



Climate change

