Top Ten Facts about Agri-biotech and Biosafety in Africa by 2015

Celebrating the 20th Anniversary of the Commercialization of Biotech Crops (1996-2015)

FACT 1

2015 was the 20th year of successful commercialization of biotech crops globally while in Africa it was the 18th.

1. The first biotech crop to be commercialized was insect resistant (Bt) cotton in South Africa in 1998. Insect resistant (Bt) maize followed in 2000, while herbicide tolerant soybean and maize were commercialized in 2001 and 2003 respectively.
2. Burkina Faso, South Africa and Sudan are the three African countries among the 28 countries globally that grew biotech crops in 2015.
3. Three biotech crops: cotton, maize and soybean had been commercialized by 2015.

FACT 2

Three countries, Burkina Faso, South Africa and Sudan maintained the momentum in commercialization of biotech crops in 2015. The countries grew biotech cotton, maize and soybean.

1. The accumulated biotech crops' hectarage between 1998 and 2015 stood at 3.5 million hectares.
2. South Africa grew 2.3 million hectares of biotech crops, Burkina Faso grew 350,000 hectares and Sudan 120,000 hectares.
3. The estimated economic benefit from growing biotech crops in Africa between 1998 and 2014 was approximately $ 2 billion.

FACT 3

For the first time in 2015, a drought tolerant trait in maize under WEMA – *Water Efficient Maize for Africa* project was approved in South Africa. Maize is the most widely grown staple crop in Africa – more than 300 million people depend on it as their main food source – it is severely affected by frequent drought.

1. Drought continues to devastate Africa, demonstrating her vulnerability to climate change impacts. The 2015 drought in South Africa for instance turned the country from a net exporter to a net importer of grain.
2. The overall effect of the 2015 devastating drought in South Africa was a decrease in biotech crops' hectarage from an intended record of 3.0 million hectares to 2.3 million hectares.
3. Five WEMA project countries: Kenya, Mozambique, South Africa, Tanzania and Uganda are either conducting and/or preparing to start trials on drought tolerant biotech maize to address the challenge of recurrent drought.

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S Africa to ease GM crop rules to avert food crisis

Country wants to increase maize imports from the US and Mexico to plug deficit

CAPE TOWN, TUESDAY

South Africa is set to relax some of its tough rules on genetically modified crops.

This is in a bid to ramp up maize imports from the United States and Mexico to avert a potential food crisis amid a severe drought, officials said.

Almost 90 per cent of maize in South Africa is genetically modified and the country bans commodities with strains not approved by the government and does not allow imports to be stored, stipulating they must be transported immediately from ports to mills.

Makenosi Maroo, spokeswoman at the Department of Agriculture, told Reuters yesterday that the government planned to permit importers to temporarily store consignments of GM maize at pre-designated facilities, to allow much bigger import volumes.

"In anticipation of the volumes expected to be imported into South Africa, the (GMO) Executive Council has approved the adjustment of a permit condition which relates to the handling requirement," Ms Maroo said.

"There is therefore no intention to relax safety assessment or risk management procedures prescribed."

The government, however, has not said when the rule changes would come into effect or whether they would be permanent.

The worst drought in a century has scorched vast swathes of croplands, affecting around 2.7 million homes in Africa's most advanced economy where shortages of white maize – a staple food for the black majority – could reach crisis proportions by October if expected summer rains do not fall, analysts said.

The country needs to import about 1.2 million tonnes of white maize and 2.6 million tonnes of yellow maize, according to the government, based on the current conservative domestic crop estimate of 7.4 million tonnes, with only Mexico and the United States able to plug the shortfall.

South African maize producers called for much more far-reaching rule changes to cope with the situation. Maroo said the government was also considering applications to register additional GMO varieties that would boost maize trade between the US and South Africa.

The South African National Seed Organisation, which represents firms such as Monsanto and DuPont Pioneer, said it has six such applications pending approval.

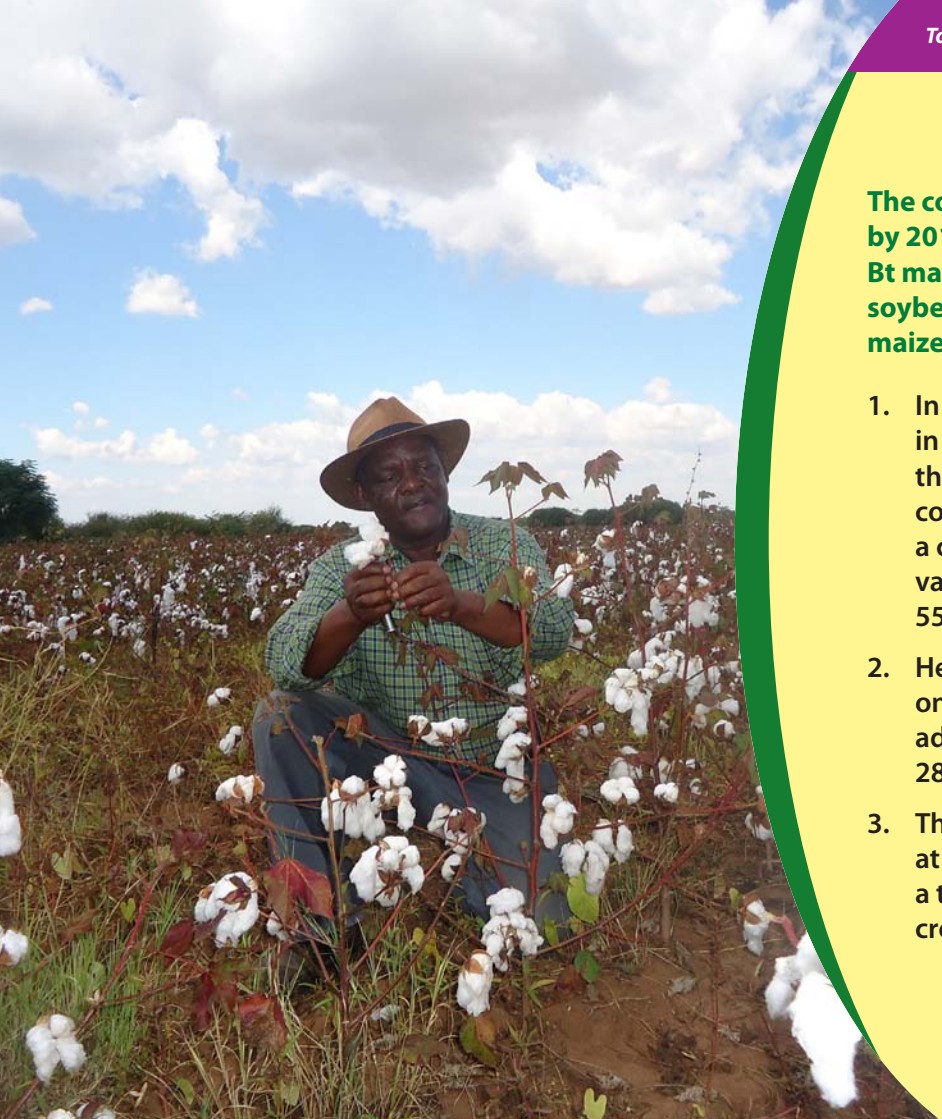
Advocates for GM crops argue it boosts yield and productivity in tough climate conditions and pestilence-prone regions, but critics say its effects on humans and the environment remain unproven.

As US crops have significantly higher numbers of GM strains, fears of contamination during handling means suspect cargoes could be rejected as illegal at South African ports due to a "zero tolerance" policy.

Most of the maize imports could come from the US rather than Mexico because US maize is cheaper and supplies more abundant, analysts said.

— Reuters

A hawker prepares a cob of corn at his makeshift shop in Soweto. South Africa will relax some of its tough rules on genetically modified crops so it can increase maize imports from the US and Mexico to avert a potential food crisis amid a severe drought, officials said. (PHOTO: REUTERS)



FACT 4

The commercialized biotech traits in Africa by 2015 were insect resistance (Bt cotton and Bt maize), herbicide tolerance (HT maize and soybean) and stacked traits i.e. Bt/HT cotton and maize, and a combination of various Bt events.

1. In 2015, insect resistant (Bt) cotton planting in Sudan increased to 120,000 hectares from the 90,000 planted in 2014. Burkina Faso's Bt cotton planting dropped by 23.8 % owing to a concern raised over the short staple cotton varieties planted. Bt maize was planted on 550,000 hectares in South Africa.
2. Herbicide tolerant (HT) soybean was planted on 508,000 hectares in South Africa - a 95% adoption rate. HT maize was planted on 284,000 hectares.
3. The stacked trait Bt/HT in cotton was adopted at a 100% in South Africa. The country planted a total of 940,000 hectares of stacked Bt/HT crops.

FACT 5

Adoption of biotech crops in Africa has delivered substantial agronomic, environmental, economic, health and social benefits for farmers and, increasingly, to society at large.

1. Adoption of biotech crops in Africa has contributed to providing a better environment globally, where in 2014 alone, 584 million kg active ingredients of pesticides were saved. Carbon dioxide emissions reduced by 27 billion kg, equivalent to taking 12 million cars off the road for one year. Further, 152 million hectares of land was saved thus conserving biodiversity.
2. Africa contributed to the 22% increase in crop yields globally and gains in global farmer profits by 68% through adoption of biotech crops.
3. African farmers are among 16.5 million small holder farmers who benefited from biotech crops. Adoption of these crops alleviated close to 65 million people from poverty globally.

FACT 6

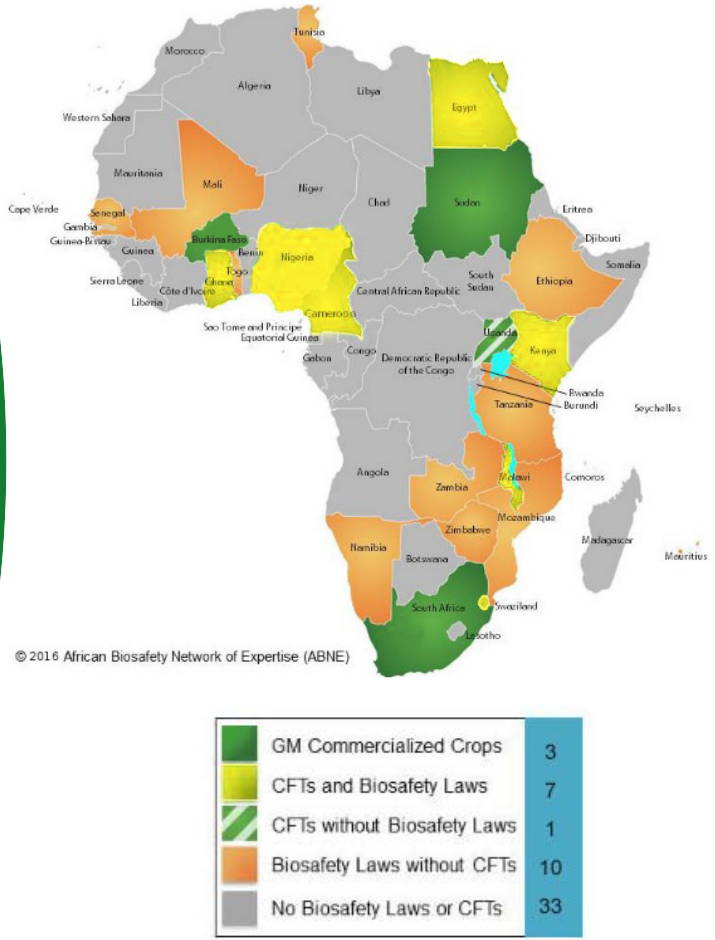
Africa could contribute 5 new biotech crops to the global food security basket in the coming years.

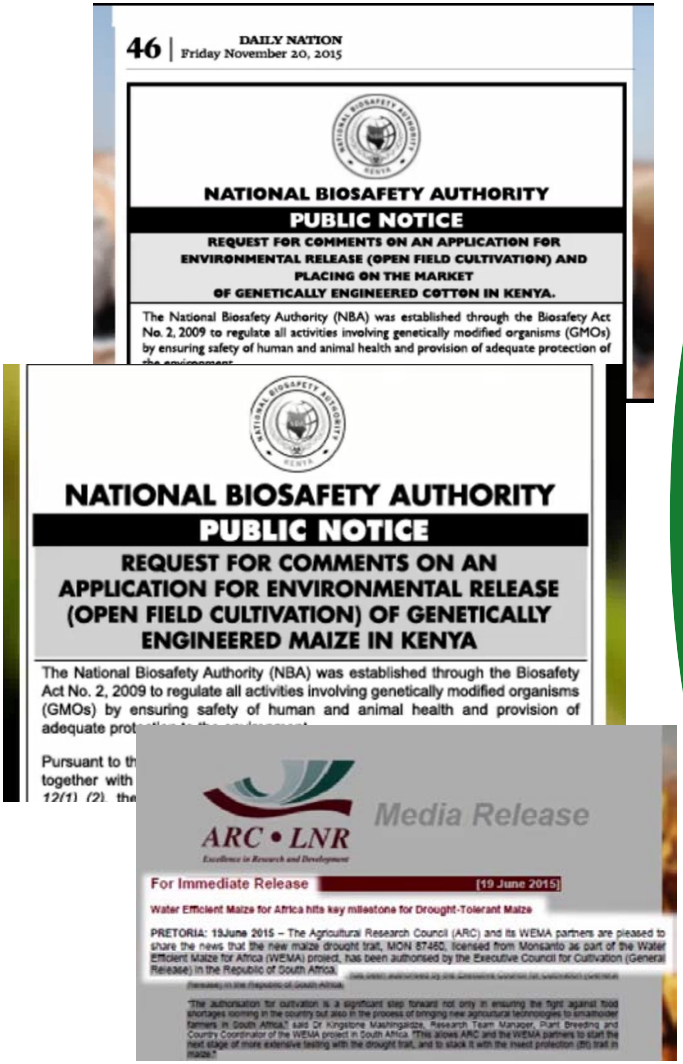
1. African scientists are conducting trials on key food security crops, which include banana, cassava, cowpea, sweet potato, maize, potato and rice, some of which are nearing commercialization.
2. In addition to the three countries that have commercialized biotech crops, 8 other countries: Kenya, Uganda, Nigeria, Malawi, Ghana, Cameroon, Egypt and Swaziland are conducting trials on crops with traits of relevance to African agricultural challenges.
3. Drought tolerance, pest and disease resistance, nutritional enhancement, nitrogen and water use efficiency, and, salt tolerance are some of the biotech crop traits for which 11 African countries are conducting trials on.

FACT 7

2015 recorded positive change in the biosafety regulatory landscape in all four sub-regions of the continent.

1. Africa's most populous country, Nigeria, enacted its Biosafety Law in readiness for tapping into the technology's benefits. Togo, Benin and Cote d'Ivoire are working towards reviewing their Biosafety Laws to make them functional.
2. Egypt completed drafting its Biosafety Bill. Once enacted, it will help researchers move products such as rust resistant wheat into commercialization.
3. Ethiopia, Mozambique and Tanzania have revised their Biosafety Laws to allow research on biotech crops, while Zambia launched her National Biosafety Authority.





FACT 8

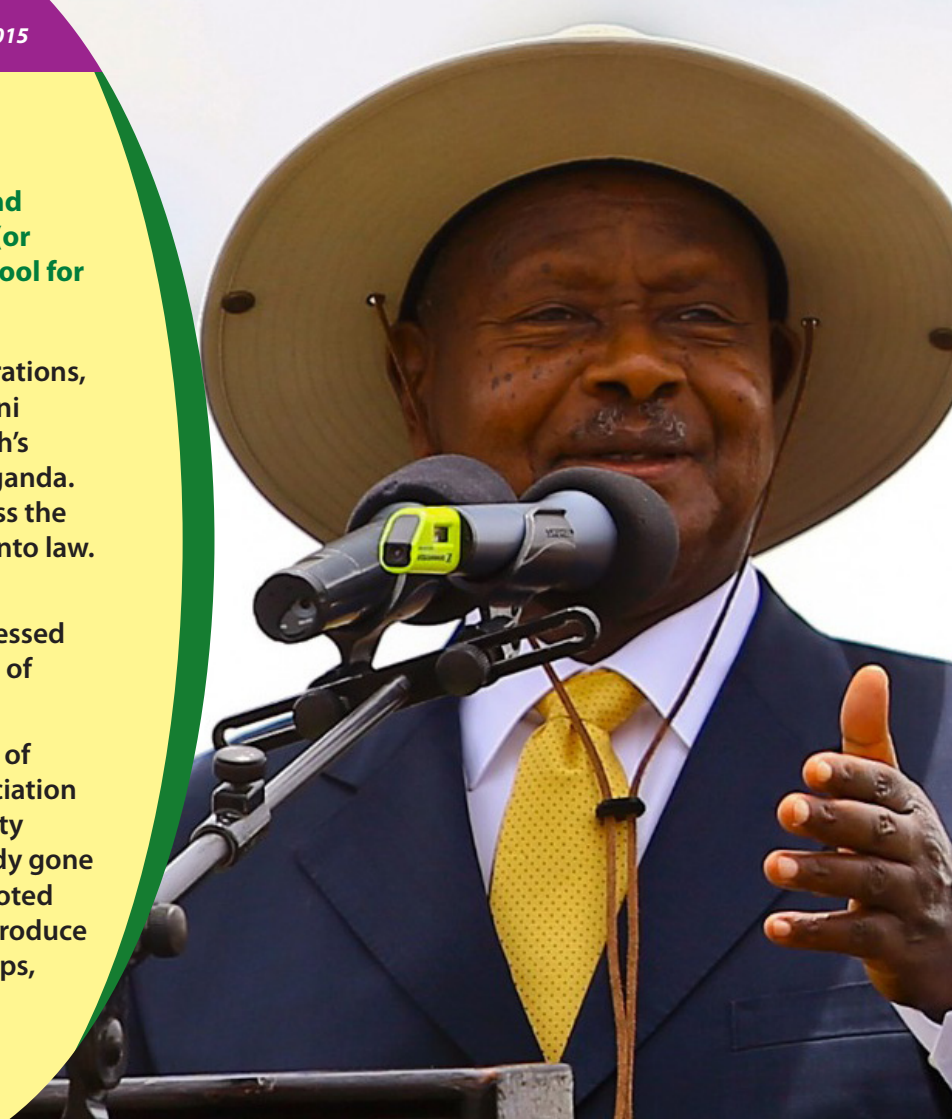
2015 recorded significant progress with regulatory approvals.

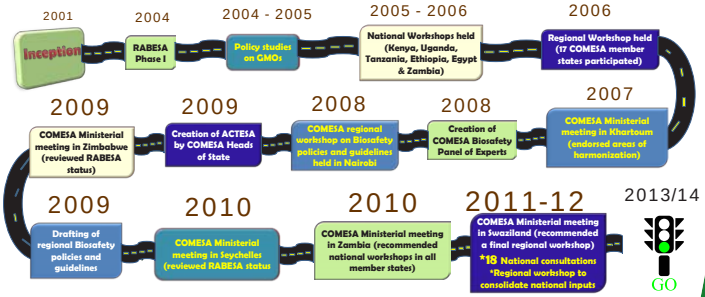
1. For the first time, Kenya's National Biosafety Authority received two applications for environmental release (open cultivation) of insect resistant (Bt) maize and cotton.
2. South Africa's Executive Council of the GMO Act approved drought tolerant trait in maize (DroughtGard®) under WEMA project.
3. The National Biosafety Council of Sudan approved the release of three additional Bt cotton varieties for commercial planting.

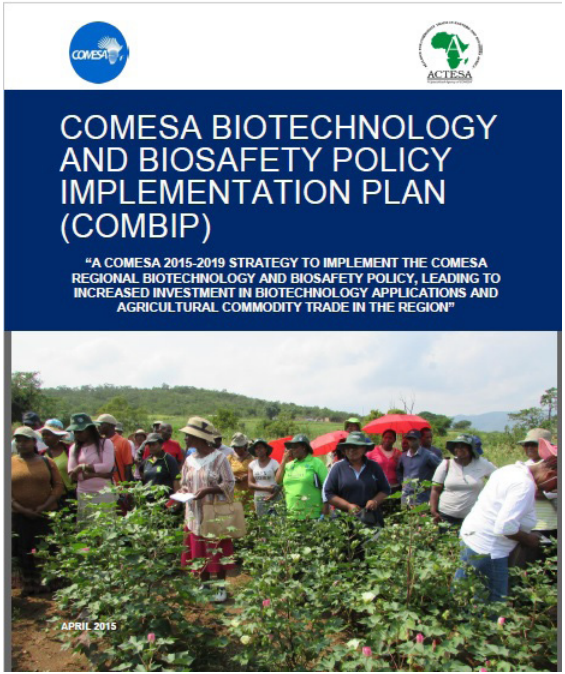
FACT 9

In 2015, African policy makers, farmers and scientists endorsed genetic modification (or modern biotechnology) as an important tool for use in agriculture.

1. During the 2015 World Food Day celebrations, Ugandan President H. E Yoweri Museveni expressed his confidence in agri-biotech's ability to improve quality of crops in Uganda. He urged Members of Parliament to pass the Biotechnology and Biosafety Bill 2012 into law.
2. Egyptian farmers pledged support for biotech rust resistant wheat. They expressed satisfaction with the crop's high degree of tolerance to fungal infection.
3. Doctors in Kenya re-affirmed the safety of biotech crops. The Kenya Medical Association (KMA) said it was satisfied with the safety record of biotech crops that have already gone through the regulatory process. KMA noted that the technology has been used to produce medicines and improve agricultural crops, with a long history of safety.







FACT 10

Efforts in regional harmonization of biosafety policies in Africa realized remarkable progress in 2015.

1. COMESA member states validated the biotechnology and biosafety policy implementation plan - COMBIP. This came a year after the approval and adoption of the COMESA policy on commercial planting, trade and access to emergency food assistance involving GMOs. The overall goal of the plan is to support member states become active participants in the global biotechnology enterprises.
2. West African Economic Monitory Union (WAEMU) ministers agreed on the need for a regional Biosafety law for the benefit of all member states. Three organizations WAEMU, Economic Community of West African States (ECOWAS), and Permanent Interstate Committee for Drought Control in the Sahel (CILSS) are steering the process.
3. East African Community continued to develop a harmonized biotechnology and biosafety policy framework for the five East African member states: Burundi, Kenya, Rwanda, Tanzania and Uganda.

Status of Confined Field Trials by October 2015				
Country	**Crop**	**Trait**	**Institutions involved**	**Status**
Burkina Faso	Cowpea	Insect resistance	INERA, AATF, NGICA, CSIRO	Multi-location trials in 3 sites
	Cotton	Insect resistance and Herbicide tolerant	INERA	CFT - 2nd season
Ghana	Cotton	Insect resistance/Herbicide tolerant	Savannah Agricultural Research Institute	Multi-location trials in 2 sites
	Rice	Nitrogen Use Efficiency/Water Use Efficiency and Salt Tolerance	Crops Research Institute	2st CFT ending in No, application for extension and relocation of sites to a more drier area (uplands)
	Cowpea	Insect resistance	AATF, Savannah Agricultural Research Institute.	2st CFT in Northern region ending in Nov 2015; application for multilocation submitted, assessing two places - Upper East and Northern regions
Egypt	Wheat	Drought tolerant/salt tolerant	AGERI	CFT approved by NBC in 2010; extended in 2014 ongoing
		Fungal resistance	AGERI	3rd season CFT approved by NBC in 2010; extended in 2014 - ongoing
	Maize	Insect resistance	AGERI	CFT approved
Sudan 4th year Bt cotton commercialized	Cotton	Insect resistance: 2 Indian Bt hybrids 1 Chinese Bt cotton variety SCRC37	Biotechnology and Biosafety Research Center China-aid Agricultural Technology Demonstration Center ,Elfaw	Multi-location trials completed for 3 additional Bt varieties; Approved for commercial planting
Nigeria	Cassava	Biofortified with increased level of beta-carotene, provitamin A	National Root Crops Research Institute	CFT 2end season completed
	Cassava	Bio-fortified cassava enhanced with Iron,(concluded)	National Root Crops Research Institute	Trials completed
	Cowpea	Insect resistant against Maruca pest	AATF, Institute of Agricultural Research	Back crossed, 2nd season Multi-locational trials in 3 sites, still on going

Status of Confined Field Trials by October 2015				
Country	**Crop**	**Trait**	**Institutions involved**	**Status**
	Sorghum	Biofortification	Africa Harvest, Pioneer Hi-Bred, a company of DuPont business, IAR and NABDA	4th CFT and back crossing with preferred Nigerian varieties, still on going
	Rice	Nitrogen use ,Water efficient and salt tolerant (NUWEST) Rice at the	National Cereals Research Institute, Badeggi	Permit granted to commence trial in 2014 but yet to commence trial
	Cassava	Cassava resistant to Africancassavamosaic virus (ACMV) and Cassava brown streak virus (CBSV).	National Root Crops Research Institute , Umudike	Permit granted, commenced trial in 2014 and still on going
	Maize	Bt + Glyphosate HT Maize	Monsanto, National Biotechnology Development Agency, Abuja	Application being processed
Cameroon	Cotton	Insect resistance & Herbicide tolerant	Bayer	CFTs completed; Application for Environmental release
Kenya	Maize	Drought Tolerance (WEMA)	KALRO, AATF, CIMMYT	CFT-6th Season completed
		WEMA Insect resistance (Bt maize-MON 810)	KALRO, AATF, CIMMYT	Review for Environmental release
		Stack maize event for Bt (MON 810) and Drought (MON 87460)	KALRO, AATF, CIMMYT	1st CFT approval granted. Yet to plant.
	Cotton	Insect resistance	KALRO,Monsanto	Review for Environmental release
	Cassava	Cassava mosaic disease	KALRO, Danforth Plant Science Center (DDPSC), IITA,	CFT–2ndseason completed.
		Cassava Brown Streak Disease Introgression into CMD tolerant background materials	KALRO, Danforth Plant Science Center (DDPSC), IITA,	1st CFT –
		Cassava Brown streak virus (CBSV) and African Cassava Mosaic Virus (ACMV)	Masinde Muliro University of Science and Technology (MMUST)	CFT_-1st season ongoing

Status of Confined Field Trials by October 2015				
Country	**Crop**	**Trait**	**Institutions involved**	**Status**
	Sweet potato	siRNA resistance to Sweet potato virus disease	KALRO-Kakamega, Danforth Plant Science Center (DDPSC)	1st CFT on going
	Sorghum	Enhanced pro-Vit. A levels, Bio-available Zinc and Iron	Africa Harvest, Pioneer Hi-Bred, a DuPont business and KALRO	CFT-.7th Season ongoing
Uganda	Maize	Drought tolerance	NARO, AATF, Monsanto, CIMMYT	CFT - 6th trial terminated in May
	Maize	Insect resistance	NARO, AATF, Monsanto, CIMMYT	CFT- 4th trial planted in August
	Banana	Bacterial wilt resistance	NARO, AATF, IITA	CFT – 2nd trial of 10 lines selected lines will be harvested in November
		Nutrition enhancement (Fe and Pro-vitamin A)	NARO, QUT (Queensland University of Technology)	
		Banana parasitic nematode resistance	NARO, University of Leeds	CFT- 1st trial harvested in June
	Cassava	Cassava brown streak virus (CBSV) resistance	NARO, DDPSC, IITA	CFT – 3rd trial terminated in July
		Cassava brown streak virus (CBSV) resistance	NARO, DDPSC, IITA	CFTs – 1st trial in 2nd site planted
	Rice	Nitrogen Use Efficiency/Water Use Efficiency	NARO, AATF, Arcadia Biosciences	CFT - 2nd trial harvested in July, constructing a rain-out shelter is on going
	Potato	Disease resistance	NARO, CIP	CFT-2nd trial planted in October

Status of Confined Field Trials by October 2015				
Country	**Crop**	**Trait**	**Institutions involved**	**Status**
Malawi	Cotton	Insect resistance	LUANAR, DARS, Monsanto	CFT – 3rd trial completed in September 2015 Application for general release under review
	Cowpea	Insect resistance	LUANAR, DARS, AATF	CFT- Approval granted in June 2015 CFT- 1st trial expected to be planted in December 2015
South Africa	Maize	Drought tolerance	Monsanto	DroughtGard® approved for conditional general release; Extensive testing under commercial circumstances to commence
		Male fertility/pollen infertility	Pioneer	Multi-location CFT at 3 sites/ 4th year
		Insect resistance/herbicide tolerance IR/HT	Dow AgroScience	Multi-location CFT planted at 4 sites
		Insect resistance/herbicide tolerance IR/HT	Pioneer	Multi-location CFT at 4 sites/New and with extension permits: 1st, 3rd, 4th& 5th years
	Cotton	Insect resistance/ herbicide tolerance IR/HT	Bayer	CFT at one site repeat/5th year
	Soybean	Modified oils/fatty acids HT	Pioneer	CFT planted at 3 sites

"Bt cotton enterprise has been rewarding, enabling me to purchase 2 tractors, a car and a house. I have also managed to pay for my younger sister's education. Attending to our crops is so much easier and has drastically reduced labour. We no longer need to carry crude tools to weed and spray as most of this is now done mechanically."

Ms. Maria Swele
Farmer, South Africa

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