TOP TEN FACTS ABOUT AGRICULTURAL BIOTECHNOLOGY AND BIOSAFETY IN AFRICA BY 2017

2017 was the 22nd year of successful commercialization of biotech crops globally and the 20th in Africa



- 1. South Africa and Sudan maintained the lead in the planting of biotech crops
- 2. Three biotech crops maize, soybean and cotton were grown in Africa.
- South Africa was among the top 10 countries that planted more than 1 million hectares of biotech crops. In Sudan, biotech cotton was the only crop that achieved the target in the country's economic remedy program.

The commercialized crop traits in Africa were insect resistance (Bt), herbicide tolerance (HT) and a stack of the two (Bt/HT) traits

- 1. Biotech cotton: Sudan planted 192,000 hectares of insect resistant (Bt) cotton, an increase from the 120,600 hectares planted in 2016. South Africa grew a total of 37,406 hectares of Bt cotton, a 315% increase from the 9,000 hectares planted in 2016.
- 2. Biotech maize: Out of the 1.96 million hectares of biotech maize planted in South Africa, 66% was stacked (Bt/HT), and the rest contain single Bt and HT traits in equal proportions.
- **3. Biotech soybean:** A total of 736,535 hectares of HT soybean was planted in South Africa, a 37% increase from 573,950 hectares planted in 2016.



South Africa and Sudan planted a total of 2.92 million hectares of biotech crops in 2017



Biotech Crops Planted in South Africa, 2017



Biotech Cotton Adoption in Sudan 2012-2017

- 1. The acreage distribution for biotech crops in Africa was: maize (1.96 million hectares), soybean (736,535 hectares) and cotton (229,406 hectares).
- 2. The average biotech crop adoption went up to 93% in South Africa and 95% in Sudan.
- 3. The combined biotech crops hectarage for South Africa and Sudan reached 2.9 million hectares, a 4% increase from 2016.

Adoption of biotech crops in Africa continued to deliver numerous significant agronomic and socio-economic benefits to farmers

- South Africa and Sudan enjoyed the increase in income benefits for farmers growing biotech cotton globally, which was US\$59.9 billion during the 21-year period 1996 to 2016 and US\$3.8 billion for 2016 alone.
- 2. The economic gains from biotech crops for South Africa in 18 years (1998 to 2016) was ~US\$2.3 billion and US\$330 million for 2016 alone.
- 3. In Sudan, over 90,000 farmers enjoyed a 2 to 3-fold yield increase by cultivating biotech cotton over conventional varieties.



Africa sustained steady progress in biotech crops research and regulation



- 1. Swaziland completed evaluation of an environmental release application for biotech cotton, while Mozambique planted the first field trial of biotech maize.
- Six countries continued to conduct multilocation trials in preparation for general release. They are Burkina Faso (cowpea), Ethiopia (cotton), Ghana (cowpea), Kenya (maize), Nigeria (cowpea and cotton), and Uganda (banana, maize, and potato). Mozambique and Tanzania approved a stacked trait insect-resistant and drought tolerant maize.
- 3. Nigeria granted a permit for biotech cassava modified for delayed post-harvest starch deterioration. Nigerian and Swaziland Governments issued import permits for biotech maize to meet food and feed deficits while Malawi planted the second season of national varietal trials of biotech cotton in eight agro-ecological sites as it aims to commercialize the crop by 2019.

Africa Biotech/GM Research and Commercialization Status by August 2018





Africa made significant milestones in biosafety policy development



- 1. The biggest milestone was the passage of Uganda's long-awaited National Biosafety Bill by Parliament in October 2017. The law awaits assent once a number of issues raised by President Yoweri Museveni are addressed.
- 2. The Government of Ghana made provisions in the national budget for the National Biosafety Authority activities.
- 3. In Nigeria, the National Biosafety Management Agency approved a set of National Biosafety Regulations, revised and approved the National Biosafety Policy 2017 while in South Africa, the Academy of Science of South Africa (ASSAf) published a consensus report on the Regulatory Implications of New Breeding Techniques (NBTs).

Demand for biotech crops in promoting sustainable agriculture and strengthening food security in Africa increased

- Various stakeholders including farmers, women and youth groups were at the frontline in dismissing misinformation that has resulted in fear of GM technology and delayed its adoption. They continued relentless demand for the technology, urging their Governments to remove hurdles that deny them access to biotech products.
- 2. In Burkina Faso, where insect resistant cotton was suspended in 2016, cotton farmers rallied their call on the Government to quickly resolve the short fiber length concern in order to reinstate the biotech cotton program. A 70% increase in chemical use has been reported in the control of bollworm resurgence while many farmers are withdrawing from growing the country's top foreign exchange earner.
- The Kenyan Government formed a taskforce to fast-track commercialization of biotech cotton, with National Performance Trials (NPTs) being conducted in seven agroecological sites. Kenyan farmers have sustained persistent demand for biotech cotton.



Africa continued forging partnerships with diverse crop technology providers



- 1. African states continued to pursue south-south collaborations to diversify the range of technology providers that has seen Asian companies partner with several African research organizations in sharing of modern crop technologies.
- Brazil and Australia have been providing valuable capacity-strengthening opportunities in the regulatory, research, and experience-sharing with biotech crops. These efforts will expand the current portfolio of efforts all aimed at accelerating access to cutting-edge technologies and tools to African farmers.
- 3. The diversity of public-private-partnerships will boost confidence in decision-making and adoption of the technology in Africa. Harnessing the immense knowledge gathered over the last two decades without re-inventing the wheel allows the continent to do a quantum jump in adoption of proven mitigation and adaptation technologies for sustainable agriculture.

Africa's progress in adopting biotech crops has been derailed by several challenges

- 1. Persistent barriers including political and international interference in policy development and implementation have stifled Africa's progress in adopting new crop technologies. For instance, in Kenya, a ban on importation of GM foods in 2012 continue to influence public perception towards biotech products.
- Restrictive, cumbersome biosafety regulations set by majority of African countries continue to be a major hurdle in development and adoption of biotech crops.
- Aggressive negative activism against the technology poses a serious threat to tapping of knowledge and skills by youth in biosciences for addressing challenges facing Africa's agriculture.

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Biotechnology students ask government to lift ban on GMOs

THURSDAY JANUARY 5 2017

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A farmer imperts his tomatoes in his greenbouse on his farm in Mathalow init Tent, Nyeri on March 31, 2016. Pressure is piling on the government to lift a ban on genetically modified crops. PHOTO | DONIFACE MWANGE| NATION MEDIA GROUP

In Summary

- The students have guestioned a recent move by MFs to uphold the ban imposed on GMOs by the Ministry of Health in 2012 but leave a window for its importation in case of food insecurity.
- The students argue the ban on GMOs has terminated progress in agriculture and food security research, eausing many bistech research and development projects to stall.





Pressure is pilling on the government to lift a ban on genetically modified crops with students from public universities accusing MPs of protecting unscruptions traders.

The students, through their union leaders, have questioned a recent move by MPs to uphold the ban imposed by the Ministry of Health in 2012 but leave a window for its importation in case of food

The opportunity cost for Africa's delayed adoption of biotech crops continued to rise

TOP TEN FACTS ABOUT AGRICULTURAL BIOTECHNOLOCY AND BIOSAFETY IN AFRICA BY 2017

- . The increase in income benefits for farmers growing biotech maize globally during the 21-year period (1996-2016) was \$US63.7 billion. South Africa is the only African country that benefitted from this increased revenue while 300 million Africans who depend on maize as a staple and were denied the choice to adopt biotech crops.
- Increase in income benefits for farmers growing biotech cotton globally during the 21-year period (1996-2016) was US\$59.9 billion. Only two African countries (South Africa and Sudan) grew biotech cotton on less than half a million hectares.
- Upon addressing challenges in adoption, Africa is poised to deliver new biotech crops into the global basket in the coming years. In 2017, significant progress was recorded in vibrant research and advanced multilocation trials nearing commercialization for food security crops such as banana, cassava and cowpea.

CROP TRAITS UNDER VARIOUS STAGES OF RESEARCH IN AFRICA BY AUGUST 2018

Ø	Maize	Drought tolerance: Water Efficient Maize for Africa (WEMA)	*	Cassava		Cassava Brown Streak Disease (CBSD) Cassava Mosaic Disease (CMD)
		WEMA Insect resistance (Bt maize)		Sweet potato		Resistance to Sweet potato virus disease
		Stacked maize event for Bt and Drought				
- (Cotton	Insect resistance	U	Banana		Banana bacterial -Xanthomonas Wilt (BXW) resistance
۲	Gypsophila flower	Pink Colouration of Petals	•	Sorghum (ABS)		Biofortification
Cameroon			Mozambique			
@	Cotton Stack herb	ked insect resistance and icide tolerance	Ø	Maize	Stacked trait- Drot tolerance and Inse resistance (WEMA)	ight ict

CROP TRAITS UNDER VARIOUS STAGES OF RESEARCH IN AFRICA BY AUGUST 2018



CROP TRAITS UNDER VARIOUS STAGES OF RESEARCH IN AFRICA BY AUGUST 2018

Nigeria	Uganda			
Cowpea Insect resistant to Maruca pest	Maize Drought tolerance and Insect resistance stacked events (WEMA)			
Sorghum Biofortification (ABS)	Banana Banana Banana bacterial -Xanthomonas Wilt (BXW) resistance Banana parasitic nematode resistance			
Rice Nitrogen use ,Water efficiency and salt tolerant (NUWEST) Rice	Biofortification Cassava Cassava brown streak Disease (CBSV)			
Maize Insect resistance Bt + Herbicide tolerant Ht corn	Cassava Mosaic Disease			
Cotton Insect resistance	tolerant Potato Potato Late blight Disease resistance			
Cassava Delayed postharvest starch deterioration	•			
Burkina Faso	Tanzania			
Cowpea Insect resistance to maruca pest	MaizeDrought tolerance; Stacked – Bt/DT (WEMA)			



ISAAA AfriCenter ILRI Campus, Old Naivasha Road, P.O.Box 70-00605, Uthiru, Nairobi, Kenya. Tel: +254 20 4223618, Fax: +254 20 4223634 Email: africenter@isaaa.org Website: www.africenter.isaaa.org



BIOTECHNOLOGY IN AFRICA

AATF ILRI Campus, Old Naivasha Road, P.O.Box 30709-00100, Nairobi, Kenya. Tel: +254 20 422 3700, Fax: + 254 20 422 3701 Email: ofab@aatf-africa.org

Website: www.aatf-africa.org

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