

New biotech crop-breeding technologies struggle for traction across much of Africa

Around the world, scientists using biotechnology advances to breed new crops are bound by an array of guidelines and regulations enacted by the nations in which they operate. Many of these countries have built these legal frameworks based, at least partly, on guidance from the Convention on Biological Diversity and the [Cartagena Protocol](#) on Biosafety.

Forty African nations are members of the convention, which emphasizes the need to protect human health and environment from the possible adverse effects. Yet only a few of these countries have enacted internal laws and regulations allowing their scientists to engage in modern plant breeding using genetic engineering with the goal of producing GMO crops.

At a recent conference in Kampala, Sunday Igu Rocks Akile presented a paper looking at the regulatory status of biotechnology applications in Africa. [Akile](#) is the programme officer for the African Biosafety Network of Expertise (ABNE).

Akile argues that challenges are presented by the wide range of regulatory operations throughout the region. This, despite that fact that many of the pests and diseases ravaging agriculture are common across borders. And with porous international boundaries, there is no way farmers will be stopped from exchanging farm items, including seeds.

Considering that seeds developed in one nation might work just as well in a neighboring country, it seems likely that there will be unregulated spread of GM seeds.

Biosafety rules operate within a framework of other laws in each particular country. These may include environmental, administrative and civil laws governing liability and redress in civil matters. For instance, most of nations in East Africa employ an administrative system governed by a National Biosafety Committee (NBC). The committee is tasked with handling applications for permits for research, multi-location trials and commercial releases.

[GM Cotton](#) Image credit: Lominda Afedraru

A farmer in Burkina Faso growing GM cotton, before the growing of GM cotton in that country was halted

Image credit: Lominda Afedraru

The five East African countries agreed to the Cartagena Protocol between 2003 and 2008. Burundi and Rwanda did so in 2008, but still have no functional regulatory system. Tanzania joined in 2003, and now handles its biosafety regulation through the Environmental Management Act.

According to Akile, Uganda represents promise for biotech development in Sub Saharan Africa, with more than 15 variants in developments in confined field trials.

Supervision of those trials is handled by research institutes and monitored by [Uganda National Council for Science and Technology](#) (UNCST). There is a policy in place, the Biotechnology and Biosafety Policy

2008 and an administrative system capable of receiving applications, reviewing, and making decisions. Inspection, monitoring and review decisions are facilitated through collaboration with other agencies, including the Ministry of Agriculture, Environment and Health.

But despite a growing framework, efforts are in danger of stagnation because [Uganda](#) still has not decided how, or even if, it will allow the commercialization of GM crops. A law was passed by Uganda's Parliament [in 2017](#), but the president refused to sign it, while asking for more information on some aspects. Legislators have responded with a modified version, which now awaits a signature.

Here's a look at what's happening in other African nations:

- Kenya ratified the Cartagena Protocol on the same day as Uganda and its National Biosafety Authority was established by the Biosafety Act of 2009. There is a National Policy on Biotechnology and Biosafety under which its administration is set up. The agency conducts its business through a Board of Directors.
- Sudan already is growing Bt cotton, implemented through its National Variety Release Committee. It approved the release of two Bt cotton varieties, a hybrid and an open pollinated one for commercial production. In 2013, the farmers planted Bt cotton on 121,500 hectares in rain-fed areas and on 81,000 hectares under irrigation. The yields led to 126-166 per cent increase of cotton production. Other countries carrying out trials in Bt cotton include Kenya, Ethiopia, Malawi and Ghana.
- The Nigeria government prioritized the functionality of its biosafety regulatory system before passing the biosafety law in 2015. Before then, biosafety was administered within the existing legal framework to ensure the commencement of multi-location trials in the country for Maruca-resistant cowpea and confined field trials for bio fortified sorghum.
- Ethiopia has amended its biosafety proclamations by removing harsh penalties for errors and omissions to pave way for confined field trials They have tested BT cotton in confined trials and are about to release the same for commercialization.
- Mozambique amended its biosafety law at the end of 2014 and is in the process of establishing a biosafety regulatory system. Currently scientists are testing the Water Efficient Maize in Africa in confined field trials.
- South Africa was the first to put the law in place and the country has been growing GMO crops since the year 1996.

Follow the latest news and policy debates on sustainable agriculture, biomedicine, and other 'disruptive' innovations. Subscribe to our newsletter.

[SIGN UP](#)

Controversy over gene drive technology

Adding a new wrinkle to the debate over genetically engineered crops is research into the use of [gene drives](#) to control mosquitos and other pests. The technology has the potential to essentially eradicate some pests – and the diseases they carry. But some experts have expressed concerns about unintended consequences of releasing the technology into the wild.

In a recent UN biodiversity conference, a team of conservationists sought to put a moratorium on the ongoing research where scientists in Africa are using gene drive technology to breed sterile male mosquitos to eliminate the population of female mosquitoes which are a cause of malaria in Africa.

Mr. Arthur Makara is among those African scientists who have vehemently opposed a moratorium saying:

This move is by multinational companies from the developed world. They don't want any scientific progress going on in Africa. They are trying to advance the agenda of selling malaria drugs on the continent to make money for their economies. The same applies to companies manufacturing mosquito nets.

[GN Cotton3 12 12 18](#)

Image not found or type unknown

Image credit: Lominda Afedraru

He argues that gene-editing technology should not even be regulated because it is not the same as the technology used to develop GMOs, where foreign genetic material is sometimes introduced into the target plant. In gene editing, scientists are working only with the genes from the target plant.

He urged developed countries to stop interfering with the scientific advancements going on in Africa but rather do it in their own countries.

Dr. Geoffrey Asea, director of the National Crops Resources Research Institute, echoes a similar view saying:

Gene editing is a technology which controlled with potential to improve crops yields and eliminate challenge faced by farmers where s solution must be found to address it, science is advancing world over and so there should be no barrier to block African scientists in carrying out their work.

He trashed the action of activists who are trying to make the work of scientists more difficult, arguing that without scientific advancement the world's economy will be stagnant.

Lominda Afedraru is a freelance science journalist in Uganda who specializes in agriculture, health, environment, climate change and marine science. Follow her on the Daily Monitor web site www.monitor.co.ug, [Facebook](#) or Twitter [@lominda25](#)