

## Agriculture Secretary launches KALRO/IITA plant for manufacturing aflasafeKE, a safe technology for controlling deadly aflatoxin in Kenya

The Cabinet Secretary, Kenya Ministry of Agriculture, Hon. Mwangi Kiunjuri, officially inaugurated a plant to manufacture the safe and effective product for controlling aflatoxin in staple crops in Kenya, known as Aflasafe KE01.

The plant is the second of its kind in Africa and was constructed as a partnership between the [Kenya Agriculture & Livestock Research Organization](#) (KALRO) and [IITA](#) to tackle aflatoxin, a major threat to the country's food security, at KALRO-Katamani. Built at a cost of US\$1.2 million, it is fully operational and can produce up to 5 tons of Aflasafe KE01 per day with the possibility of expansion.

Speaking at the launch ceremony, Hon. Kiunjuri noted that the plant marked an important milestone in the fight against aflatoxin, a well-known carcinogen and a major health challenge in the country.

He said the Government of Kenya was very committed to ensuring the country is food secure and aflatoxin was a threat to this goal.



Hon. Cabinet Secretary Mwangi Kiunjuri accompanied by other dignitaries unveiling the plaque to commission the KALRO/IITA manufacturing plant.

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## Ghanaian farmers can now control Aflatoxin, earn big



Aflasafe in the field.

A study has identified the best non-toxic strains that can limit aflatoxin contamination in laboratory and field conditions. One of the authors, [Dr Alejandro Ortega-Beltran](#), a plant pathologist with [IITA](#) says, "We were able to detect non-toxic strains with the highest ability to limit crop contamination in the laboratory and the highest efficiency to prevent aflatoxin producers from reaching treated crops."

The study, which was recently published (August 2019) in [Frontiers](#)

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"I have been informed the plant has already processed 120 tons of the product ready for distribution and my Ministry will take up 70 tons for demonstration. We will also use up 10% of the money we have set aside for subsidies to work with country governments in aflatoxin hotspot areas to subsidize the product for farmers to create awareness," he said.

Aflatoxin is a deadly chemical produced by naturally occurring fungi that attack many crops including maize—a key staple food for a majority of the country's population—while in the field and in storage.

In his remarks, IITA-Eastern Africa Hub Director, [Victor Manyong](#) said, "Aflatoxin is a silent killer and is usually very difficult to control once it contaminates our grains, our feed, and products such as milk and eggs. We are therefore happy that we have a very effective antidote for it."

Dr Manyong further commended the Kenyan Government through the Ministry of Agriculture and partners led by KALRO for their support that saw the fast-paced development of the Aflasafe product and the construction of the plant, saying this is a clear indication of their dedication for ensuring that the country is food secure.

In his congratulatory message, the Deputy Mission Director for [United States Agency for International Development](#) (USAID) Kenya and East Africa, Patrick Wilson, noted that aflatoxin was a global problem even in the United States. He noted that the current challenge was to sustainably scale-up the technology to ensure all farmers are able to access it.

"This facility is a first of its kind in East Africa, giving Kenya the opportunity to lead the region in tackling aflatoxins. Tanzania, Malawi, and Rwanda are also moving towards Aflasafe production in their countries in partnership with the private sector," Wilson said.

Aflasafe is a completely safe, natural product that drastically reduces aflatoxins in crops. It has shown high efficacy of up to 98% in reducing aflatoxin levels in maize and has demonstrated its ability to maintain low or no contamination both pre- and postharvest.

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*IITA-EA Hub Director, Victor Manyong, congratulating Hon CS, Mwangi Kiunjuri.*



*Mwangi Kiunjuri, touring the KALRO/IITA aflasafe factory for a demonstration on the manufacturing process.*



*Patrick J. Wilson, Deputy Mission Director for USAID Kenya and Eastern Africa giving his remarks.*



*Agriculture Secretary and USAID Deputy Mission Director wave off a lorry carrying aflasafe KE01 purchased by the Ministry for demonstrating to farmers in aflatoxin hot-spot areas.*



The [United States Department of Agriculture](#) (USDA) first developed the base technology. IITA, together with USDA, adapted and improved the technology for use in Africa starting in Nigeria where Aflasafe was first registered and the first plant in Africa was constructed.

In Kenya, it was developed through a collaboration of KALRO, IITA, USDA-ARS among many other partners. It has been registered by the Pest Control Products Board (PCPB) with KALRO as the registrant.

Other partners involved in the development and registration of Aflasafe KE01 include the Kenya Plant Health Inspectorate Service (KEPHIS), Ministry of Agriculture, the National Irrigation Board and county governments, [African Agricultural Technology Foundation](#) (AATF), and [ACDI-VOCA](#).

USAID, the Bill & Melinda Gates Foundation, USDA, and the [CGIAR Research Program on Agriculture for Nutrition and Health](#) (A4NH) supported the effort. All these partners were also behind the construction of this modular Aflasafe KE01 manufacturing factory at KALRO-Katamani and a regional laboratory to assist in constant monitoring and surveillance efforts of to control aflatoxin and build capacity.

The construction of the plant was initiated in 2016 and finalized last year. IITA is providing technical backstopping while KALRO staff will manufacture Aflasafe KE01. The modular facility also serves as an incubator of the



*IITA-EA hub director, Victor Manyong speaking at the commissioning of the plant.*



*IITA's Charity Mutegi explaining the quality control activities for aflasafeKE01 in the plant's mycotoxin laboratory.*

technology to attract the private sector, which will ultimately be responsible for wide-scale production and distribution of the product.

In addition to Kenya and Nigeria, local versions of Aflasafe are available in

Burkina Faso, The Gambia, Ghana, Malawi, Mozambique, Senegal, Tanzania, and neighboring Zambia.

Get more information about Aflasafe at <https://aflasafe.com/>

## **Ghanaian farmers can now control Aflatoxin, earn big** Continued from page 1

[in Microbiology](#), has great public health implications for Ghanaian maize and groundnut farmers and consumers. As Ortega-Beltran adds, "We selected the eight most efficient strains to compose two Aflasafe products. These products are now registered with authorities in Ghana. Farmers can now apply Aflasafe in their fields, which will enable them to produce maize and groundnuts that have low aflatoxin content. These safe crops can enter domestic and international premium markets."

Aflatoxin is a major cause of ill health and lost trade opportunities in many African countries, including Ghana where

solutions have been sought for decades. Consuming aflatoxin-contaminated food causes stunting in children and increases the risk of liver cancer in adults.

In Ghana, maize and groundnut are the crops with the highest aflatoxin levels. Government authorities have set the acceptable limit of aflatoxin at 15 parts per billion (ppb) for maize and 10 ppb for groundnut. However, levels over 50 ppb are a common occurrence.

Although aflatoxin can be controlled in farmers' fields, Ghana has been focusing on postharvest interventions. This has not been effective in reducing aflatoxin levels in food because crop infection and

contamination often begin in the field. Once crops are contaminated, aflatoxins cannot be completely removed.

Since 2013, the use of non-toxic and natural biocontrol agents has been sought as an alternative for aflatoxin control in Ghana. A group of researchers from IITA and other agricultural institutes, led by [Ranjit Bandyopadhyay](#), IITA Principal Scientist (Plant Pathologist), carried out a study to detect the best non-toxic biocontrol agents for aflatoxin management in Ghana.

The study showed that substantial displacement of aflatoxin producers from soils and crops occurred

in treated plots across the three agroecological zones where these strains were tested. The displacement was observed also in neighboring non-treated crops. Eight of the most superior strains were selected as active ingredients of two biocontrol products, each one containing four atoxigenic strains. This means that soon, Ghana will have two aflatoxin biocontrol products named Aflasafe GH01 and Aflasafe GH02.

Both of these Aflasafe products are a practical, efficient, and cost-effective tool to reduce aflatoxin contamination thus reducing aflatoxin-related diseases and increasing access to local and international premium markets seeking aflatoxin-compliant crops.

The research revealed that several atoxigenic *Aspergillus flavus* isolates are associated with both maize and groundnut grown across diverse agroecological zones in Ghana. However, the potential of atoxigenic isolates native to Ghana to competitively displace aflatoxin producers and limit aflatoxin content in the field has not been investigated.



*Maize contaminated by aflatoxin.*

The 2019 study examined the ability of 12 non-toxin producers to move from the soil to crops and limit aflatoxin contamination. The 12 isolates were chosen for testing if they were similar to the non-toxic biocontrol active ingredients already in use in other West African countries, and also if they were able to limit aflatoxin contamination in laboratory conditions.

Aflatoxins are produced by several fungi belonging to *Aspergillus* section *Flavi*, which grow in soil and decaying vegetation and ultimately infect crop grains. However, the most common aflatoxin-producing species worldwide is *A. flavus*.

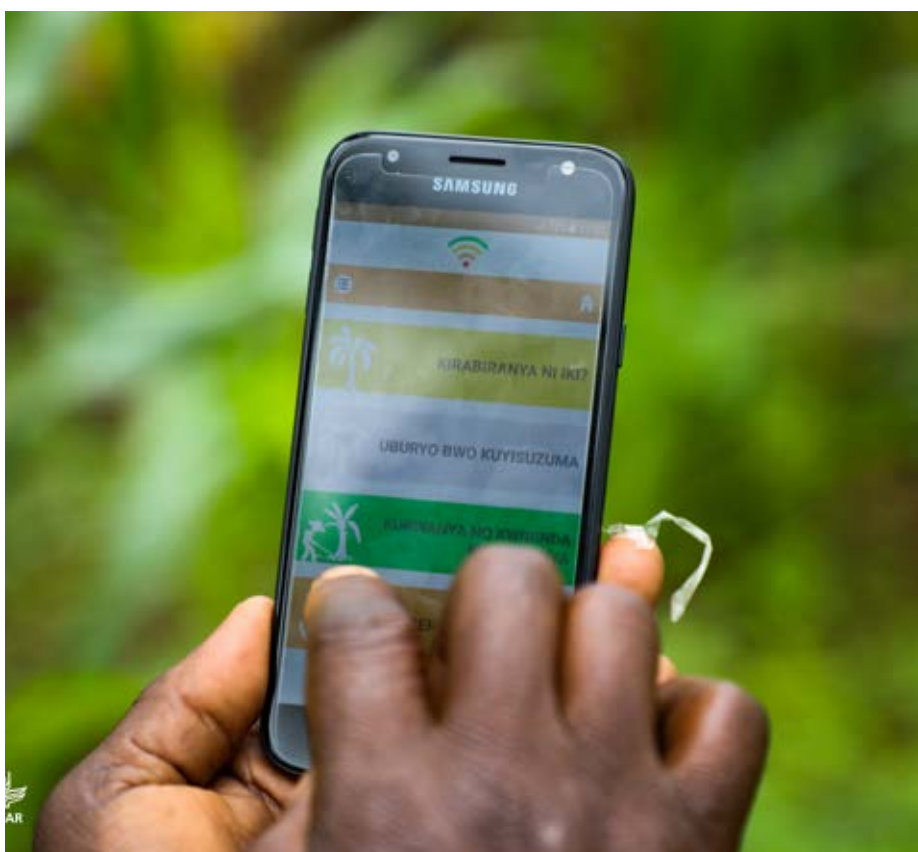
Atoxigenic biocontrol is already in use in Burkina Faso, the Gambia, Italy, Kenya, Nigeria, Senegal, Tanzania, and the US.

## IITA-Rwanda releases a digital application to help the fight against bacterial wilt disease in banana

[IITA](#)-Rwanda, together with partners, has launched a digital application that will serve more than 5,000 farmers across the country to diagnose, control, and prevent Banana *Xanthomonas Wilt* (BXW) in banana plantations.

The BXW Application (also BXW-App; pronounced “Box-Up”) provides a stepwise digital approach that empowers farmers to diagnose BXW in their fields and take immediate action, as part of an early warning system to combat the disease and prevent its spread to neighboring plants/farmland.

BXW-App is now available on Google Play Store for android and users can access, download, and use it to systematically diagnose BXW in banana farms, and much more! The BXW-App is being tested in eight districts of Rwanda: Burera, Gatsibo, Gisagara, Karongi, Kayonza, Muhanga, Rubavu, and Rulindo with 69 Rwandan Farmer Promoters. However, interested users across the country can now access and



*BXW-App is available on Google Play Store for android.*



use the application, which is configured in the national Kinyarwanda language for an optimal user experience.

“We believe you cannot control what you cannot monitor. So we are convinced the first step in controlling BXW is to develop a functioning and automated system that enables real-time reporting and monitoring of disease incidences, and empowers observers (farmers or any citizen) on the field to deploy relevant control measures,” said [Julius Adewopo](#), who leads the project “Citizen science and ICT for advancing the prevention and control of Banana Xanthomonas Wilt (ICT4BXW)” at IITA-Rwanda.

The project is being implemented in collaboration with several partners, including the [Rwanda Agriculture and Animal Resource Development Board](#) (RAB), [Bioversity International](#), and [Leibniz Institute of Agricultural Development in Transition Economies](#) (IAMO) with financial support from [Deutsche Gesellschaft für Internationale Zusammenarbeit](#) (GIZ). The project aligns with the ICT for Rwanda in Agriculture (ICT4RAG) Strategy 2016–2020 of the Ministry of Agriculture and Animal Resources.

By 2020, the project aims to have fully piloted the decision-support tool, reaching at least 5,000 banana farmers. After that, the project partners aim to secure a second phase during which the tool will be actively promoted for use on a larger scale in Rwanda and elsewhere in the African Great Lakes region.

During a field visit to one of the focal districts for the testing of BXW-App, farmer promoters noted that the app has greatly facilitated their role and improved their engagement with farmers to provide credible advisory support for banana production.

“Before this app for BXW was introduced to us, we were using paper, and walked long distances to report. Now we diagnose and report BXW incidences through the App (and phone) immediately. Moreover, when we are training farmers using the ICT4BXW application, they are easily convinced, as they see that the information we are giving them is from a credible source by going through all the steps together, seeing pictures displaying on the phone, showing various steps that are followed until it indicates that the banana stem does not have BXW or it does,” Umutoni Mathilde, Farmer Promotor in Kayonza District said.

Sixty-nine farmer promoters have been trained under this project in partnership with



*Farmer promotor explaining to farmers how the BXW App works.*

RAB, to use BXW-App for diagnosis and control of BXW in farmers' fields. They have been also equipped with smartphones to facilitate their implementation of this pilot exercise.

“This application is helping us to witness in real time the signs of BXW in banana fields. Before the BXW App, signs of BXW in a banana stem could be confusing. For example, it was difficult to know if the plant sap that comes when you cut a banana stem has BXW or not. But with BXW-App, it shows photos of what the infected plant sap looks like, so a farmer can compare this with what is on a cut banana stem, then decide if it is BXW,” emphasized Murenzi Vianney, Officer in charge of Agriculture in Kayonza District.

BXW-App was developed through an inclusive and participatory design process and has four modules. The first module introduces why it is important to control BXW, and the second module enables users to diagnose the disease by stepwisely observing the banana field/stands and answering questions as prompted by the app. The third module provides on-site recommendation for control of BXW, while the fourth module offers general agronomic information for banana management as an add-on incentive to facilitate healthy and productive banana. The BXW-App may be extended soon to other African countries if piloting and scaling are successfully implemented in Rwanda.



*The BXW-App empowers farmers to diagnose BXW by themselves.*

# IITA Nematology/Striga laboratory undergoes facelift in Ibadan campus

On 4 October, [IITA](#) West Africa Hub Director, [Robert Asiedu](#), inaugurated the newly refurbished Nematology and Striga laboratory at the Ibadan campus of the Institute. Project leaders and a GRC representative were among those present at the ceremony.

In his remarks, Asiedu congratulated the staff and commended them for their persistence and hard work in the pursuit of the sustenance of the laboratory in a dwindling fund climate.

Also present at the launch, Project Leader of the [Yam Improvement for Incomes and Food Security in West Africa Phase II](#) (YIIFSWA-II), [Norbert Maroya](#), encouraged the staff working at the laboratory to continue with the standard they have shown across the years.

Plant Pathologist Yao Kolombia summarized the feeling of the nematology laboratory team, by stating, "I am very happy today, to see that West Africa Hub has not forgotten the Nematology laboratory. The reason is that nematology is also very important for agricultural development as it affects many crops. I will like to commend the Hub Director for his constant support."

The Nematology and Striga laboratory began operations in 1991. Over the years, funding challenges incapacitated laboratory maintenance, even though the laboratory is instrumental in the agronomic research through the various services it provides.



*The lab team with some inauguration participants.*

In 2015, the West Africa Hub replaced the dated soil sterilization machine used in the laboratory with a new steam sterilizer machine to control disease pathogens, nematodes, insects, and weeds. With this state-of-the-art equipment, the laboratory now provides good quality sterilized soil for use in plant propagation units, for fields, and even for household gardens. Apart from good quality sterilized soil, the laboratory also provides diagnostic services and management advice for nematode problems, through the nematode field review and identification.

With the purchase of the soil sterilization machine, the laboratory commenced the gradual process of cost recovery of services provided by the laboratory.

With the view of expanding the service provision of the laboratory, the WA Hub administrative office procured and installed a new OMAX Digital Trinocular compound LED Microscope in the laboratory. This microscope allows for better imagery of nematodes as well as capturing the pictures of the nematode for precise identification.

Laboratory Manager Wumi Adewuyi took the attendees on a tour of the laboratory, demonstrating the transformation through a slideshow highlighting the status of the laboratory before and after the facelift.

The West Africa Hub Director closed by saying that the services provided by the laboratory should be made known to all within the IITA campus as nematode infestation affects not only research crops.

## Events

**1st Aflasafe for Africa Conference, Arusha, Tanzania, 4–5 November**

**Food Security Synthesis Caravan Conference, IITA headquarters, 5 November**

International Plant Protection Congress (IPPC) 2019, Hyderabad, India, 10–14 November

**5th Nutritious Food Fair, IITA headquarters, 13–15 November**

**Board Meeting and R4D Week, IITA headquarters, 18–22 November**



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