

## Banana plants' defense against deadly wilting disease may be in the soil

*Fusarium* wilt, a soilborne fungal disease popularly known as Panama disease, is one of the most devastating diseases of banana. It is responsible for the crop's declining yield in the Great Lakes region of Africa, where banana is a major source of food and income for millions of smallholder farmers.



Digging and collecting soil around the banana roots to evaluate the microorganisms.

The disease is spread by the fungus *Fusarium oxysporum* f. sp. *cubense* (Foc), which enters the root systems of banana plants and blocks the uptake of nutrients and water. It causes yellowing of leaves, splitting of the pseudostem, and eventual death of the banana plant. Furthermore, the disease cannot be managed by synthetic pesticides/fungicides and easily spreads through the exchange of planting materials (banana suckers), water, and movement of people and equipment.

All traditional East African highland cooking banana (EHAB) known as Mchare and some dessert bananas like Sukari Ndizi are susceptible to this disease. However, it was observed that only a proportion of the plants die after infection. A team of researchers from [IITA](http://iita.org), therefore, sought to understand this phenomenon of microorganisms—bacteria and fungi—surrounding the roots as well as in the roots and corm. This is called the soil microbiome.

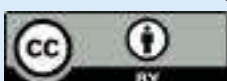
[to page 3](#)

## Belgian Ambassador visits the President Olusegun Obasanjo Research Campus in DRC



Ambassador Indekeu (second from right), asking questions about SAH cassava cuttings.

On 17 February, the Ambassador of the Kingdom of Belgium to the Democratic Republic of Congo (DRC), Mr Jo Indekeu, visited [IITA](http://iita.org)'s President Olusegun Obasanjo research Campus in Kalambo, DRC. His wife accompanied him along with his Political Advisor Mrs Séverine de POTTER. The purpose of the visit was to familiarize themselves with the research-for-development activities of IITA in South Kivu.



IITA Country Representative and Central Africa Hub Deputy Director, [Zoumana Bamba](#), along with Head of Station, [Adebowale Akande](#), received the Ambassador. Other scientists were on hand to welcome the Ambassador including Project Coordinator and Impact Economist, [Paul Dontsop-Nguezet](#); Program Manager for Aflasafe, [Joseph Atehnkeng](#); Regional Integration Specialist, [Mamadou Fofana](#); Systems Agronomist for CIALCA, [Kokou Kintche](#); System Agronomist, [Leon Nabahungu](#); and Rector of Université Catholique de Bukavu (UCB), Prof Kanigula Mubagwa.

In his welcome remarks, Bamba outlined the research-for-development activities of IITA in collaboration with various national and international partners. In particular, he commended UCB for its support to and close collaboration with the Station. He also highlighted the Investment of the Belgian government in the Great Lakes Region through IITA in the development and dissemination of different technologies and capacity building of the national scientists and practitioners by moving from farming to integrated livelihood systems and agricultural systems for nutrition.

The Ambassador and his team embarked on a guided tour of the Station including stops at the Institute's laboratory facilities and agroprocessing activities. They were impressed with the modern equipment for advanced analysis in soil, molecular biology, and rhizobiology as well as the technology in the Tissue Culture and Aflasafe laboratories.

Considered to be among the best in DRC and in the region, the facilities

aim to serve the entire Great Lakes region (Burundi, Congo, and Rwanda) especially on improving food safety and nutrition security in the region. These laboratories will help the Central Africa region produce healthy planting materials of important African food crops as well as look for solutions to cassava diseases to improve and sustain cassava productivity through the development and promotion of varieties resistant to brown streak and other biotic constraints in DRC.

In the laboratories, the visitors asked many questions on Aflasafe, such as its mode of application. They praised the Institute for its exceptional and impactful activities in the country.

In his parting remarks, Ambassador Indekeu assured the Institute of Belgium's continued support for its research activities. He was also excited about the possibilities for collaboration with universities in Belgium and of the socioeconomic development of agriculture in the region.



Central Africa Hub Deputy Director, Zoumana Bamba (left), and the Ambassador (middle) share a warm exchange.

## Got a story to share?

Please send your story with photos and captions every Tuesday to [iita-news@cgiar.org](mailto:iita-news@cgiar.org) or Katherine Lopez ([k.lopez@cgiar.org](mailto:k.lopez@cgiar.org)) and Uzoma Agha ([u.gha@cgiar.org](mailto:u.gha@cgiar.org)) for headquarters and Western Africa, Catherine Njuguna ([c.njuguna@cgiar.org](mailto:c.njuguna@cgiar.org)) for Eastern and Southern Africa, and David Ngome ([d.ngome@cgiar.org](mailto:d.ngome@cgiar.org)) for Central Africa.



## Banana plants' defense against deadly wilting disease may be in the soil

They suspected that soil microbiome interaction with the banana plant provides some defense against the fungal pathogen. And if true, this may pave the way for the development of biocontrol products to protect banana against the disease using soil microorganisms. They were able to establish a correlation between the level of microbiome diversity with the resistance to the pathogen invasions in the roots.

"This study allowed us to have a better understanding of the root microbiome in banana that can be harnessed to develop novel disease management tools in Mchare based on beneficial microorganisms (endophytes and biological control agents) for smallholder farmers in sub-Saharan Africa," says [Manoj Kaushal](#), an IITA Systems Agronomist, based in Dar es Salaam, Tanzania, who led the study.

The researchers profiled the root microbiomes of banana both with and without symptoms of the disease.

Each sample showed substantial differences in the community composition and species abundance. The beneficial bacteria identified in the root samples included *Actinomycetales*, which are known to produce various metabolic compounds that help to suppress various plant and soilborne pathogens.

Others were *Pseudomonadales*, well-known to be responsible for beneficial plant-microbe interactions, and *Streptomyetaceae*, which are known to produce antagonist compounds against various plant pathogens.

Future research will be focused on the isolation, characterization, and screening of various indigenous microbial strains with the target to develop a product from these microbial strains (single or consortium) that will provide enhanced tolerance against banana Fusarium wilt disease to boost the production of banana in the region.

The IITA banana research program aims to improve soil health and increase the yields of the EAHB more sustainably.

This study was published in *Plants-MDPI* (<https://doi.org/10.3390/plants9020263>) on 18 February 2020.



Banana stump showing the symptoms of Foc.

## STEP-Kenya motivates students at CSAYN forum

On 20 February, the [IITA](#) Start Them Early Program (STEP) team from Kenya attended a forum of the Climate Smart Agriculture Youth Network (CSAYN) at the [University of Nairobi](#), Upper Kabete campus. The STEP team comprised Lorraine Mutinda, Samuel Kamau, Maryfaith Simiyu, and Stallone Mambo, a student representative from Mwiki Secondary School.

The Principal of the College of Agriculture and Veterinary Science (CAVS) opened the CSAYN forum, which provides a platform for mentorship of secondary school students by agricultural professionals and fellow youth studying agriculture at the university level. Such gatherings help to integrate the students' classroom knowledge and theory

with practical application in office and field settings.

During the meeting, STEP-Kenya was able to recruit, influence, and capture the attention of the youth, university stakeholders, and agricultural professionals from the private sector and the media. It was also an opportunity to create a database of youth who would like to volunteer as STEP mentors and trainers.

Stakeholders discussed the perception of students towards agriculture and highlighted that degree enrolment in agricultural courses has decreased by 25%, from 24,221 students in 2017 to 18,165 in 2018. Most students in these courses were found to lack motivation and had a

negative perception regardless of them pursuing the course. Some of the reasons for this negativity included a lack of requisite knowledge on current agricultural trends, policy changes, modern technologies, and innovations, as well as an overall view of the drudgery of agriculture.

This emphasizes the importance of STEP in Kenya, as it strives to change the attitudes of young people toward careers in agriculture and agribusiness and build a team of future African agribusiness leaders. The participating students were taken through the importance of digital solutions in agriculture, useful tips on looking for internships and jobs, updating resumes, and mastering interviews.



STEP-Kenya and other CSAYN forum participants.

# Harmony with nature: The story of Alec Butler

As a research institute, the main business of [IITA](#) centers on science and generating measurable data. However, walking or driving into the IITA headquarters in Ibadan, Nigeria, for the first time may leave you feeling like you just stepped out of reality and into a fairy tale. Such is the beauty and excellence of the 1,000 hectares on which the Institute sits, that some consider it a prime destination for ecotourism in Nigeria.

When the Institute was set up in 1967, Alec Charles Butler, the first Grounds Superintendent, was one of the early team members who had a major influence on the development of the campus. Butler came to Nigeria and immediately set about laying the basis of a beautiful, fit-for-purpose research campus in Ibadan.

A conservationist at heart, Butler sought to maintain harmony with nature and his work prioritized the preservation of biodiversity. He prepared the landscape for the campus, established the plant nursery, and planted many of the beautiful trees, shrubs, and flowers, a lot of which are still thriving on the campus today. In 1969, he also assisted John Craig with building the eponymously named dam within the campus, which impounds water from the Awba River running through the Gunwin watershed.

"He was also responsible for the design and building of the golf course and was a keen golfer himself," said IITA Deputy Director-General, Corporate Services, [Hilde Koper-Limbourg](#). "After leaving IITA, Alec and wife Flo continued to be regular visitors to the Institute until only a few years ago. When visiting, he would always look around critically and give his successors tips and advice," she continued.

Echoing those sentiments, IITA Director of Advocacy and Country Alignment Function (ACAF), [Kwesi Atta-Krah](#) said, "His contributions to the Institute continue to flourish and blossom through all the wonderful trees and flowers that we enjoy from those 50-year-plus trees!"

This fondness for IITA was something Butler demonstrated to both his friends and colleagues and he continued to stay



Speaking at the Alumni Day 2017.

engaged with the Institute through the IITA Alumni Association. Butler was one of the retiree alumni who graced IITA's 50<sup>th</sup> Anniversary celebration, during which he cut the tape at the tree planting exercise establishing the trees bordering the newly named Golden Jubilee Crescent, formerly Equatorial Crescent.

At the celebration, former Head of the IITA Forest Center, Deni Bown acknowledged Butler and his contributions, which included planting the beautiful avenues of trees along the residential roads of the IITA campus. Butler was also given the honor of planting one of the first 50 African nutmeg plantlets planted during the Alumni Day at the IITA-at-50 celebrations.

Over the past 30 years, Butler took part in most of the alumni reunions that took place, and he was Chair of the IITA Reunion (Europe). "Alec loved IITA, and he was my idea of a perfect gentleman and a great husband," said Dr Stephen Lawani, current Chair of the Alumni Association.

Atta-Krah noted that the trees around the Golden Jubilee Crescent, planted during the IITA-at-50 celebrations, recently started flowering, "as if to wish Alec a flowery goodbye!"

Alec Charles Butler, former Head of the Physical Plant Services (PPS) and the first Grounds Superintendent/Building and Grounds Service Officer, in IITA Ibadan, passed away on 23 February 2020, surrounded by his family.

We will miss you, Alec! Thank you for your great work, and for transforming the IITA campus into something that everyone enjoys to the present!



Top: Alec Butler (seated, third from left) with the Grounds team in the early days.  
Bottom: Cutting the tape at the tree planting and street naming exercise during IITA's 50th Anniversary celebration.

# IITA supports formation of Tanzania Cassava Producers and processors Association (TACAPPA)

IITA has collaborated with other stakeholders to develop and launch the Tanzania Cassava Producers and Processors Association (TACCAPA), which brings together cassava producers and processors to address bottlenecks and challenges facing production and utilization of the crop in the country.

The Tanzania Deputy Minister for Agriculture, Hon. Omary Mgumba, launched TACAPPA on 10 February in Dar es Salaam. Mgumba noted that cassava is an important food crop with the potential to be a cash crop. He said, to support commercialization of the crop, the Government of Tanzania is formulating a policy to substitute wheat with 20% cassava flour in all baked products.

However, he said the productivity of cassava in the country does not meet the market demand. This was due to several reasons including poor agriculture practices, not planting improved varieties, and lack of market linkages. This in turn makes cassava flour expensive. He further commended the efforts of research institutes for their work on cassava, especially breeding for drought and disease resistance, which had resulted in the official release of 20 varieties.

In her remarks, the TACAPPA Chairperson Mwantumu Mahiza said Tanzania has a high demand for starch, but starch used in the country is imported while it can be produced locally from cassava. She also noted the unavailability of improved varieties, delay of research results, inadequate knowledge on cassava farming, and lack of markets

as among challenges facing the farmers, hence, the need for an association.

“We want an association so that everyone who is in the cassava business would have one voice. We want cassava to be recognized as a strategic crop. Cassava is the only crop which can get us out of poverty—out of one-acre of farm produce, a farmer can consume a quarter and sell the remaining three quarters,” she said.

IITA was among the institutes that supported the formation and launch of the cassava association. Speaking at the event, IITA Senior Scientist, Frederick Baijukya highlighted the Institute’s efforts in boosting cassava production and commercialization. He said, “Cassava is a priority crop for IITA, which has been doing research on it for more than 50 years.”

He noted that IITA has two major projects addressing the challenges in the cassava value chain. One of these is “Building Economically Sustainable Cassava Seed Systems (BEST Cassava) funded by the Bill & Melinda Gates Foundation, which is working towards ensuring the availability of clean quality cassava varieties through commercialized systems. The second project is the [African Cassava Agronomy Initiative](#) (ACAI), which is developing and promoting best practices in cassava agronomy to maximize output.

IITA staff also participated and displayed some of the technologies related to cassava. The Deputy Minister and other participants



IITA Youth Agripreneur Abella Munisi (right) explaining about IITA agriculture technologies to the Deputy Minister of Agriculture Omary Mgumba.

were thrilled with the Nuru app and coating of cassava with beeswax to extend the crop’s shelf life. “These technologies should be made accessible to the farmers so they can use them,” he said.

IITA has been working on improving cassava production through breeding, finding solutions to pests and diseases, and establishing a cassava seed system. IITA also introduced mechanization of cassava processing using modern equipment.

In Tanzania, cassava is the second major staple food after maize. Many regions in the country, with about 1.9 million farmers, engage in producing the crop. Apart from the economic benefits, the crop plays a big role in terms of food security and nutritional purposes.



Deputy Minister of Agriculture Omary Mgumba (fourth from left) with stakeholders after he launched TACAPPA in Dar es Salaam, February 2020.

# Youth Agripreneurs day out at Fasola Grammar School

The Start Them Early Program (STEP), which operates under the [IITA](#) Youth in Agribusiness office, focuses on how to advance agribusiness development to secondary schools in Africa. It aims at redirecting the aspirations of young people in secondary schools towards careers in modern agriculture by exposing them to viable opportunities in agribusiness at an early stage.

Nine secondary schools have been selected in three countries—the Democratic Republic of Congo, Kenya, and Nigeria—to implement the pilot phase of the project.

The STEP-Nigeria team selected three schools within the Southwestern region of the country to implement the pilot phase of the program, namely Fasola Grammar School, Oluponna High School, and Lead City International School.

Fasola Grammar School and Oluponna High School are both government schools situated in rural communities, with the former located in a subsistence livelihood setting, and the latter in a market-oriented, mixed agriculture area. The third school is a private school, with not much land area for establishing demonstration fields but high levels of classroom and laboratory instruction.

At Fasola Grammar School in Oyo State Nigeria, the team is currently carrying out construction and renovation work on some laboratories and classrooms in preparation for modernized training in agribusiness.

On 21 February, the team from the Youth in Agribusiness office visited the school and expressed a deep sense of pride with the ongoing work being carried out by IITA. The team comprised Adetola Adenmosun, Lead of the Youth in Agribusiness Office; Eniola Olanrewaju, ICT Officer; Oludoyin Adedayo, Administrative Officer; Adesanya Omotomiwa, Communication Officer; Oluyemi Adunoye, Coordinator of the Youth Employment in Agribusiness and Sustainable Agriculture (YEASA) Project; and Adefioye Adedayo, STEP Coordinator.

Adunoye said, “The STEP program is more than introducing agriculture to students in secondary schools. It is a revolution that would promote the development of future national and global leaders from the most unlikely places.” She noted that though resources were limited, extensive

impact can be achieved with everyone chipping in.

Other team members spoke of the experience as a revelation and a moment of reflection on what they could do to improve the learning experience of the students of Fasola Grammar School. They also expressed hope that other corporate organizations and well-meaning individuals could support the cause of students in rural areas and provide them with the basic infrastructure needed to enhance learning.

The STEP Coordinator expressed his delight at having their Youth in Agribusiness colleagues see the progress made so far at Fasola Grammar School. “We exchanged ideas on how to make things better at the school and we are not going to relax until we achieve our goals,” he concluded.



Top: STEP Coordinator, Adedayo Adefioye (left), takes the team on a tour of some of the old facilities.  
Bottom: The team inspecting a newly renovated laboratory.