IITA
Transforming African Agriculture
CGIAR

IITA news
No. 2524 10–14 February 2020

Do not regulate genome-edited crops – IITA scientist

11 February was the International Day for Women and Girls in Science. IITA joined the rest of the world to celebrate the contribution of our women scientists in ensuring a food and nutrition-secure world. Women account for half of the world's population and we cannot make representative and long-lasting changes in agriculture without them.

As United Nations Secretary-General, António Guterres explains, "To rise to the challenges of the 21st century, we need to harness our full potential. That requires dismantling gender stereotypes. On this International Day of Women and Girls in Science, let's pledge to end the gender imbalance in science."

IITA recognizes the importance of both science and gender equality and makes a particular effort to empower female scientists to participate in the achievement of internationally agreed development goals. Leena Tripathi is one such woman scientist. As a principal scientist and leader of IITA's transgenic and genome editing research, based in Nairobi, Kenya, Tripathi has proved that women can provide leadership in the use of cutting-edge research tools.

In a video, Tripathi talks about the work she and her team are doing to improve disease resistance in crops, specifically banana.

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IITA's labor of love, transforming African agriculture

IITA delivers technologies to farmers, including improved crop varieties.

To love, or not to love, that is not the question! How to love…now that is real the question.

Since 1967, IITA has been on a journey of love, developing solutions to eradicate hunger by ensuring food security, especially in sub-Saharan Africa. The Institute has done this by championing research to increase crop yield and fight adverse conditions including drought, crop diseases, and invasive species.

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The majority of people in Africa still live in rural communities and depend on what they grow to feed themselves. IITA's work helps these smallholder farmers to have better crop quality to address their nutrition needs through biofortification—a process by which the nutritional quality of a food crop is enhanced through plant breeding.

With Africa's population set to double by 2050, increasing food production has become a top priority, one to which IITA is fully committed. The Institute's crop improvement programs not only focus on enhancing nutritional quality but also on increasing yield per hectare. Activities in this area ensure that smallholder farmers move from subsistence farming to producing enough crops to increase their income.

As IITA Ambassador, Chief Olusegun Obasanjo said during IITA's 50-year celebration in 2017, "We must get whatever you produce out there to the farmers. And whatever it takes us to get your products to the farmers, I believe it's worth it." He added, "Getting the products to the farmers is almost as important as getting the products ready because the product that is not in the hands of the farmers is a wasted product."

Over the years, IITA's core function has progressed from just research for development and now encompasses multilevel technology delivery to ensure that people actually benefit from the results of the research. By focusing on turning farming activities into viable business operations IITA is giving people the tools they need to generate a sustainable income from agriculture.

Helping to get more women and youths into agriculture is a key focus in much of the Institute's research-for-development activities. This is an essential part of improving livelihoods as it means that the agricultural sector will continue to grow across sub-Saharan Africa, and that farmers and rural communities will increasingly benefit from greater food security and a stronger economy.

This year being the International Year of Plant Health further serves to highlight some of IITA's most important work, which is concerned with producing and keeping crops healthy. The toll from pests, diseases, toxins, and invasive flora extends beyond plant health and poses a major health risk to humans as well as having a negative impact on the economy.

So this is how IITA expresses love. Loving farmers is indeed loving us all and loving the future as this ensures our food security now and for years to come. So with every new research, every improved variety delivered, every biocontrol agent developed, every good farming practice transmitted, IITA is unfolding a love letter, not just to the farmers but to the people of Africa, and indeed the rest of the world.

IITA delivers technologies such as Aflasafe, the safe natural solution to the problem of aflatoxin, to improve the livelihoods of farmers.

Got a story to share?

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

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Do not regulate genome-edited crops – IITA scientist

"Using genome editing, we can silence the gene that causes susceptibility to streak virus in banana." When the gene is silenced, it means the banana cannot contact the disease; this leads to better yields and improved farmer incomes.

However, Tripathi is not thinking about the farmer only, but the consumer as well. "Consumers should expect safe and tasty banana," she says, adding, "With genome editing, we are not adding anything to the banana—just silencing the susceptibility gene."

The researcher also calls upon regulators to facilitate the adoption of genome-edited crops in Africa by fostering a favorable policy environment—not one that stifles.

Tripathi is one of 36 internationally recruited women scientists working with IITA in various hubs across Africa. As an equal opportunity employer, IITA is proud to be associated with women scientists who work diligently to ensure Africa's food security.

Watch the full video of Tripathi's interview here: https://youtu.be/QBdYOA0dvRY

Scientists develop effective tool for exploring the genetic diversity of the bacterial wilt pathogen in banana and enset in East and Central Africa

One of the diseases affecting banana in East and Central Africa and threatening the food and income of over 70 million people is Xanthomonas wilt (XW), a disease caused by the bacterium *Xanthomonas vasicola* pv. musacearum (Xvm).

Banana Xanthomonas Wilt-infected banana plants in a banana farm.

The disease also attacks enset, an ancient false banana indigenous to Ethiopia, where it was first reported in the 1960s. The disease was first detected in banana in Uganda in the early 2000s and has since spread across neighboring countries, affecting all cultivated types of both crops.

Despite its economic impact on banana and enset production, little is known about the population biology and epidemiology of Xvm. It is very important in control efforts to understand the origin of the pathogen, decipher the evolutionary mechanisms leading to pathogen adaptation to new crops, and identify ecological factors (including the crop system composition) favoring this adaptation.

Therefore, scientists have developed a highly effective genotyping tool, the Multi Locus Variable Number of Tandem Repeat Analysis 19 scheme (MLVA-19) for unraveling the origin and pathways of emerging Xvm populations in East and Central African countries.

A total of 335 bacteria isolates were collected from DR Congo, Ethiopia, Kenya, Rwanda, Tanzania, and Uganda and confirmed to be Xvm using Xvm-specific primers subjected to the MLVA-19 scheme. The analysis showed that the MLVA-19 was discriminative enough to distinguish different haplotypes from country to field scales. The study also established that MLVA-19 can resolve the evolutionary patterns and invasion routes of this pathogen.

This genotyping tool is thus perfectly suited for exploring the genetic diversity of the Xvm populations in East and Central Africa and addressing evolutionary and ecological questions that are important for deciphering the epidemiology of Xanthomonas wilt on banana, including the reconstruction of Xvm invasion routes throughout Africa.

This tool can be further used in a transnational surveillance network to monitor the spread and evolution of XW throughout Africa and inform and guide the management of Xvm both in banana-based and enset-based cropping systems. It can also be used to assist the regional deployment of new Xvm-resistant banana and enset progenitors.

The study was conducted by IITA researchers in Uganda and Tanzania in collaboration with the Department of

Biochemistry, Genetics and Microbiology, Centre for Microbial Ecology and Genomics/ Forestry and Agricultural Biotechnology Institute, University of Pretoria, Pretoria, South Africa; UMP IPME, University of Montpellier, CIRAD, IRD, Montpellier, France; and CIRAD UMR BGPI, Montpellier, France.

The findings were published in the open-access article: "A new Multi Locus Variable Number of Tandem Repeat Analysis Scheme for epidemiological surveillance of *Xanthomonas vasicola* pv. *musacearum*, the plant pathogen causing bacterial wilt on banana and enset" found at: https://journals.plos.org/plosone/article/comments?id=10.1371/journal.pone.0215090

The study was funded by the BAXEPI project, supported by the Agropolis Foundation through the Investissements d'avenir program; the CGIAR Research Program on Roots, Tubers, and Banana (CRP-RTB); the COST Action CA16107 EuroXanth supported by COST (European Cooperation in Science and Technology); and the French Embassy in Uganda.

BXW-infected banana fruits in Uganda.

STEP makes progress promoting agribusiness in secondary schools in Africa

Since its inception in 2019, the IITA Start Them Early Program (STEP) team has been working tirelessly towards advancing agribusiness development in secondary schools in Africa. The aim is to redirect the aspirations of Africans towards careers in modern agriculture by exposing them to viable opportunities in agribusiness at an early age.

To achieve this, an initial operation program is being carried out in three African countries—Democratic Republic of Congo (DRC), Kenya, and Nigeria. The two-year project, which is funded by the International Development Research Centre (IDRC), would serve as a kickstart for building the next generation of agribusiness leaders in Africa.

Ten secondary schools were selected in the three countries. In DRC, Institut Weza, EDAP/ ISP, and Institut Mushunguri were selected in the South Kivu Province. Mwiki Secondary School, Nairobi County; Afraha High School, Nakuru County; Kisayani Secondary School, Makueni County; and Muongoiya Secondary School, Kiambu County, were selected in Kenya. While Fasola Grammar School, Oluponna High School, and Lead City International School were selected in the Southwestern region of Nigeria.

Training and practical sessions have begun in all the selected schools to promote agricultural activities. In DRC, the STEP team organized a special agribusiness holiday program for the students. This aimed to create clubs that offer young people a favorable environment for learning on agribusiness and arouse their interest in agricultural research and a career path in agriculture.

In Nigeria, training has commenced for teachers and students on the use of ICT in agriculture. This will develop and strengthen the teachers' usage of digital tools and technologies in facilitating learning and creating awareness and give the students the opportunity to develop their ICT entrepreneurship and innovations.

Aside from leveraging the IITA Youth Agripreneurs' (IYA) expertise and incubation centers close to selected schools, STEP is partnering with the USTADI Foundation under the VijaBiz project on youth empowerment through agribusiness, in Kenya.

Plans are in progress to train 1197 youths in the first six months of 2020, including 593 students in DRC, 210 in Kenya, and 394 in Nigeria. The training would center on the application and enhancement of the STEP model across the 10 selected schools in the three countries.

Top: Barivure Bekee, STEP ICT Officer in Nigeria, training Fasola Grammar School teachers on the use of computers. Bottom: Prince Bobo, STEP Coordinator in DR Congo, addressing the students during the agribusiness holiday program.