

IITA to partner in global efforts to contain serious disease threat to the world's bananas

FAO and partners Bioversity International, IITA, and the World Banana Forum have launched a global program requiring \$98 million to contain and manage a new *Fusarium Wilt* strain—Tropical Race 4 (TR4) that is jeopardizing livelihoods that rely on banana—the world's most traded fruit.

IITA will lead efforts in deploying existing knowledge, human resources, and capabilities to breed for resistant bananas against TR4 based on its extensive experience in banana breeding in the continent.

Fusarium wilt (TR4) was first detected in Southeast Asia in the 1990s and has now been identified at 19 sites in 10 countries, including the Near East, South Asia, and

Mozambique in sub-Saharan Africa. This insidious disease can last for years in soils and can hitchhike to new fields and destinations through several means such as infected planting materials, water, shoes, farm tools, and vehicles.

"This is a major threat to banana production in several regions of the world. We need to move quickly to prevent its further spread from where it is right now and to support already affected countries in their efforts to cope with the disease," said Hans Dreyer, Director of FAO's Plant Production and Protection Division.

"The long-term resilience of banana production systems can only be improved through continuous monitoring, robust containment strategies, strengthening



Banana is a staple food in most of East Africa.

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GHU highlights the impact of CGIAR on germplasm conservation and distribution

IITA's Germplasm Health Unit (GHU)—as part of the CGIAR Genebank Platform—and its stakeholders lead the celebration of Phytosanitary Awareness Week, 23-27 October, at IITA.

Phytosanitary Awareness Week was celebrated in 11 other CGIAR centers, which organized events to highlight the importance of promoting and creating awareness on sanitary, phytosanitary,

and plant health issues; how to carry out preventive measures against pests and diseases that can be transmitted; and the role of CGIAR GHUs in the international distribution of pest-free germplasm.

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Lava Kumar giving a presentation during the Phytosanitary Awareness Week in IITA, Ibadan, Nigeria.

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national capacities, and enhancing international collaboration to deploy integrated disease management approaches," he added.

The global program is initially targeting 67 countries in a bid to prevent its spread and management. Without a coordinated intervention, scientists estimate that the disease could affect up to 1.6 million hectares of current banana lands by 2040, representing one-sixth of current global production with an estimated annual value of \$10 billion. The program aims to reduce the potentially affected area by up to 60%.

"There is also an important knowledge gap regarding the biology and management of

the fungus and we aim to address these through this collaborative initiative, also promoting introduction of more biodiversity and improved agronomic practices into banana production systems," said Ann Tutwiler, Director General of Bioversity International, speaking on her behalf and that of IITA.

The five-year program is designed to build on existing initiatives tackling the disease and focuses on strengthening local technical capacities and supporting the development of science-based technologies and tools through research on biology and epidemiology of the fungus, its detection, surveillance, rapid containment actions, soil health, and the development of resistant cultivars.

IITA is currently partnering with renowned worldwide research teams in an ongoing regional banana breeding program in the Great Lakes Region (<http://breedingbetterbananas.org/>).

For areas where the disease is not present or first appears, inspection, surveillance and rapid response measures will be developed. Where it already occurs, improved and integrated disease management techniques will be developed along with the search for and deployment of resistant varieties.

If effectively rolled out, it is estimated that every \$1 invested in the program today will produce benefits of between \$98 and \$196 in 20 years' time.

What is *Fusarium wilt* TR4?

Part of the *Fusarium oxysporum* f.sp. *ubense* family, the disease is caused by a new variant of the fungus that had decimated banana plantations in the early 20th century, ultimately causing more than \$2 billion in damages and leading to the replacement of the Gros Michel banana type with the Cavendish variety. The Cavendish proved resistant to the earlier strain of the fungus but has now succumbed to the new race TR4.

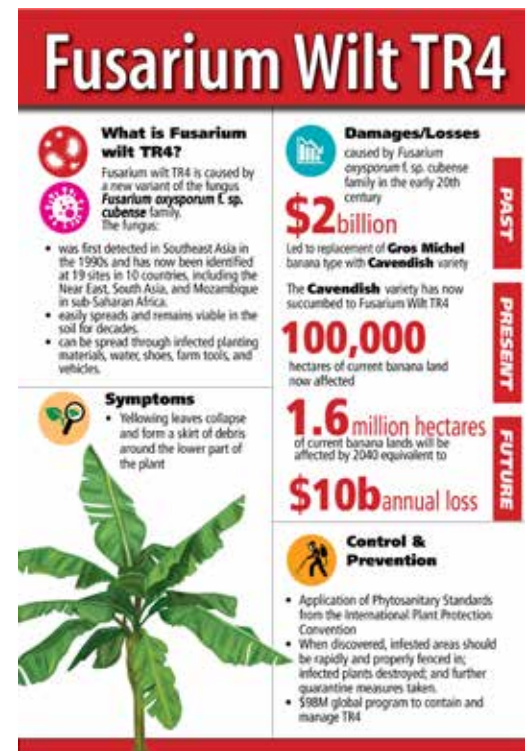
The TR4—which so far has impacted nearly 100,000 hectares according to estimations of scientists—particularly affects the Cavendish banana, which accounts for around half the bananas grown today, but also other cultivars that constitute key nutritional staples. Despite banana's large role in global trade, around 85% of annual production is consumed locally.

Affected plants show yellowing leaves, which then collapse and form a skirt of debris around the lower part of the plant. The fungus can easily spread and remain viable in the

soil for decades. This is why the phytosanitary standards provided by the International Plant Protection Convention are essential as the best approach by far in preventing the fungus from arriving in a new country or region.

When discovered, infested areas should be rapidly and properly fenced in, infected plants destroyed and further quarantine measures taken. Implementation of such measures will vary widely according to whether production systems are based on smallholder farming, mixed-cropping systems or monoculture plantations.

More information is available here: Global programme on *Fusarium wilt* disease of banana: Engaging stakeholders in combatting TR4: Side event at World Banana forum, 7-10 November: <http://www.fao.org/world-banana-forum/wbf3/wbf3/en/>
[New banana disease to Africa found in Mozambique](#)
[Call to action to contain Foc - TR4 affecting banana in Africa](#)



Announcements

- **Phylogenetic Workshop**, IITA, Yaounde, Cameroon, 13–17 November
- **Open Access Training**, IITA, Ibadan, Nigeria, 13–17 November
- **R4D Week**, IITA, Ibadan, Nigeria, 20–24 November
- **Board Meeting**, IITA, Ibadan, Nigeria, 20–24 November
- **Science Conference** on Food and Nutrition Security: Foresight and Futures, IITA, Ibadan, Nigeria, 24–25 November
- **Open Day**, IITA, Ibadan, Nigeria, 25 November
- **Introduction to Liquid Chromatography and Mass Spectrometry**, IITA, Yaounde, Cameroon, 13–17 November

Got a story to share? Please email it with photos and captions every Wednesday to Katherine Lopez (k.lopez@cgiar.org), Jeffrey T. Oliver (j.oliver@cgiar.org), Catherine Njuguna (c.njuguna@cgiar.org), or David Ngome (d.ngome@cgiar.org).

At IITA, Ibadan, GHU convened a seminar on 25 October, to promote awareness and exchange ideas on the importance of germplasm health in preventing the transboundary spread of pests and pathogens.

The seminar was the highlight of the week's celebration, with Head of GHU and Virologist [Lava Kumar](#), and also coordinator of the GHU Component of the Genebank Platform giving a presentation titled "Germplasm Health: Interplay of legal and technical factors in mitigating biorisks to germplasm conservation and distribution." It was attended by IITA staff, students, and National Agricultural Quarantine Service (NAQS) officials.

In his introductory remarks, [Michael Abberton](#), Head, IITA Genetic Resources Center, gave an overview of the Genebank Platform and encouraged stakeholders to continue their efforts to move the agenda of preventing the spread of pests through germplasm forward.

In his presentation, Kumar gave an update on the safe distribution of germplasm and what the CGIAR centers are doing with regard to phytosanitary compliance in germplasm exchange.

Kumar also highlighted the importance of germplasm health, improving biosecurity policies for risk mitigation, global capacity to handle invasive threats, policy regulations governing the international distribution of germplasm, guidelines for plant health monitoring, and approaches to ensure germplasm health.

"As an institute involved in international germplasm movement, if we are not careful, our germplasm can carry diseases into other countries, which could cause disease outbreaks," he said.

CGIAR's agri-food system, which has the highest level of international germplasm distribution worldwide, ensures that the GHUs provide phytosanitary services to genebanks. GHUs have a crucial role in supplying disease-free materials directly to seed systems for multiplication and distribution to farmers and partners. Every year CGIAR centers attend to over 2,000 requests for seed, clonal, and tree germplasm from more than 100 developing countries.

In the course of the program in IITA Ibadan, there was a meeting between the NAQS and GHU where training needs of NAQS staff for 2018 and the lab

infrastructure development plan were discussed.

In an interview, Kumar asserted, "Our ultimate aim is to spread the message about the good work the CGIAR centers are doing with regard to phytosanitary compliance when it comes to germplasm exchange; create awareness; and attract more support from all over the world."

The Awareness Week was implemented by four teams: the first to inform on the status quo, the second to provide an update on the latest developments, the third team to encourage internal users and their partners to comply with phytosanitary regulations, and the last team to initiate new partnerships and strengthen existing partnerships.

In his concluding remarks, Ogunfumilayo Akindele, Head, NAQS, Post Entry Diagnostic Station, commended Lava Kumar, the GHU team, and IITA as a whole, for being the lead research partner facilitating agricultural solutions for a food-secure Africa. "NAQS supports this partnership with IITA. We pledge to support and work hand in hand with this outstanding institution to fight against germplasm contamination; because IITA doesn't stand for Nigeria alone; the institute stands for Africa.

More about the work of CGIAR GHUs

CGIAR genebanks located in centers of crop diversity host more than 750,000 accessions of vital food, forage, and tree crop germplasm, including cassava, maize, rice, potato, sweetpotato, groundnut, sorghum, chickpea, bananas, in addition to thousands of improved varieties bred for resistance to pest and disease, resilience to climate change, and richness in micronutrients such as pro-vitamin A. The IITA Genebank in Ibadan, Nigeria, represents the single largest collection of invaluable genetic resources of major food staples such as cassava, maize, yam, plantain, cowpea, and other legumes in sub-Saharan Africa.

Crop germplasm is a high value commodity and the germplasm conserved in the CGIAR genebanks and the improved varieties developed by the breeding programs are regularly exchanged at a high frequency with national and international programs for crop improvement, diversification, food production, commerce, and agricultural development. Germplasm exchange,

however, has inherent risks of introducing exotic pathogens that include viruses, fungi, bacteria, phytoplasma, weeds, insects, and nematodes.

In CGIAR, GHUs have been established in centers involved in crop improvement research. These include Africa Rice, Bioversity, CIAT, CIP, CIMMYT, ICARDA, ICRAF, ICRISAT, IITA, ILRI and IRRRI.

The GHUs enable the exchange of healthy and pest- and disease-free germplasm between and among centers and partners in various countries in accordance with the requirements of the national plant protection organizations regulations and the FAO International Plant Protection Convention (IPPC).

GHUs provide vital support to genebanks and breeding programs in production and maintenance of pest and pathogen-free germplasm for conservation

and use. Collectively GHUs, genebanks, and crop improvement programs ensure germplasm distributed from

CGIAR centers are healthy and of high quality and, meet the phytosanitary requirements of national and international legislation.

GHUs develop phytosanitary procedures to eliminate pathogens from germplasm and create versatile diagnostics tools for health indexing tests for screening invasive, exotic and endemic pathogens. The Units track changes in global pest and pathogen profiles and develop appropriate controls to tackle new challenges. They work proactively to transfer knowledge and technologies to build phytosanitary capacity among partners programs.

"Germplasm health is one of CGIAR's unknown success stories," Kumar said. "CGIAR has the highest level of international germplasm distribution worldwide. Every year CGIAR centers attend to about 2,000 requests for seed, clonal, and tree germplasm from more than 100 countries. The majority of these requests are from developing countries.

Deputy Minister of Agriculture praises IITA's technologies and pledges support to register aflasafeTz

The Deputy Minister for Agriculture in Tanzania, Dr Mary Mwanjelwa, expressed appreciation for the efforts of IITA to develop the agriculture sector in Tanzania. These interventions include developing innovative technologies to increase production such as improved varieties, to add value to agricultural commodities, and to reduce postharvest losses.

Mwanjelwa was particularly impressed by ongoing efforts to control aflatoxin and reduce its negative impact on health and trade through the innovative biocontrol product aflasafeTZ and assured the Institute of the government's support in the registration in the country.

The Minister said this when she visited the IITA booth during the week-long national World Food Day celebrations in Tanzania. She further urged the Institute to step up efforts in educating communities about aflatoxins and ensuring aflasafeTZ is accessible and available to farmers.

Other visitors to the booth included the Minister of Agriculture, Dr Charles Tizeba (MB); the Permanent Secretary for the Ministry of Agriculture, Eng. Mathew Mtigumwe; the Geita Regional Commissioner, Maj Gen (rtd) Ezekiel E.

Kyung; and the District Commissioner, Stanley K. Nduguru.

World Food Day is celebrated every year on 16 October in honor of the date of the founding of the Food and Agriculture Organization (FAO) of the United Nations in 1945. This year's theme was "Change the future of migration: Invest in food security and rural development" and Tanzania celebrated in Geita, northern Tanzania.

IITA joined this year's celebration that brought together governments,

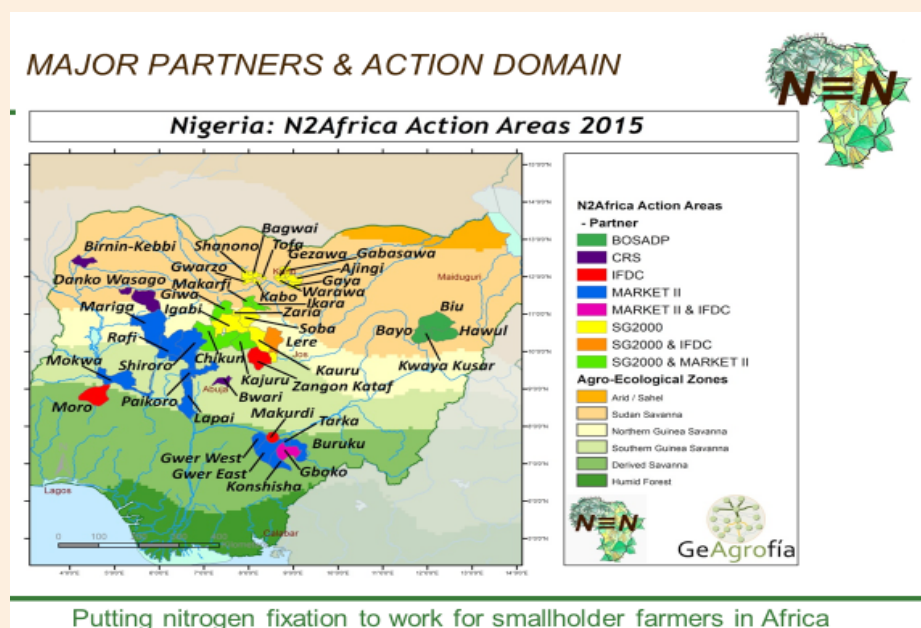
nongovernment organizations, and private entrepreneurs who took part in the exhibitions where the Institute showcased inoculants (BioxFix, Nodumax, LegumeFix), biocontrol technologies for combating aflatoxin (Aflasafe), postharvest storage technologies (Collapsible Dryer Case), and value-added products made by the Tanzania Youth Agripreneurs (TYA) such as cassava flour (Mpishi Mkuu brand), cassava flour products (strips, chinchin, "visheti", gari), and yellow maize flour produced from vitamin A yellow maize.



Dignitaries visiting the IITA booth.

N2Africa success story: Nigeria

The N2Africa project is working through sustainable, long-term partnerships to enable Nigerian smallholder farmers to benefit from symbiotic N₂-fixation by grain legumes through effective production technologies including inoculants (NoduMax) and phosphorus fertilizers. The project focuses on cowpea, groundnut, and soybean and has reached 50,000 farming families in Benue, Kaduna, Kano, Kwara, and Niger states and the FCT and 15,000 farming families in Borno State as at the end of 2016 cropping season.



N2Africa project operational areas and partners in Nigeria, 2015 to date.

The project also has a strong focus on engaging youth as agents of change towards increased food production, improved livelihoods, and reduced unemployment. This is being done through mentorship and capacity

building on new agricultural production technologies, entrepreneurship development, provision of starter packages, and facilitating access to credit. Due to N2Africa's intervention in partnership with IITA

Youth Agripreneurs (IYA), young people are beginning to embrace agribusiness as an income generating activity. One hundred and twenty-seven trained youth are currently employed in agricultural value chain business activities.

An Agripreneur's journey: from an unemployed youth to a successful entrepreneur

Mercy Haruna Wakawa from Borno State, Nigeria, was enthusiastic about getting a job after graduating from the University of Maiduguri where she studied Food Science and Technology. However, her dreams crashed when jobs were not forthcoming due to the high rate of youth unemployment in the country.

Today, she is the founder and Managing Director of a successful agribusiness company, Confianza

Global Resources that processes groundnut into oil and cake for livestock feed. Her journey into agribusiness started with the interventions of the IITA Youth Agripreneur (IYA) program and N2Africa.

"After so many futile efforts to get a job, I was almost at the point of giving up when I got the opportunity to participate in enterprise development training alongside other youths from Borno State in September 2014. I was not really keen but enlisted for the training to just be part of anything. I did not know that something meaningful was going to come out of it. The training was organized by IITA Youth Agripreneurs at the IITA Kano Station. It was a three-week, mind-changing, intensive training, which covered topics in agribusiness, entrepreneurship, ICT in agribusiness, fish farming, and science-driven agricultural practices," she said.

"After the training, hesitatingly and reluctantly, but with counselling and guiding support, I ventured into the postharvest processing of groundnut. The business took off in January 2016. I was given a starter package by N2Africa."

Mercy says groundnut processing is a profitable business as a ton of good groundnut seed produces



Mercy's business on groundnut oil processing.

an average of 450 liters of oil and 400 kg of groundnut cake, which is a major raw material for animal feed. Confianza Global Resources currently employs four youths from the host community. The business has also created downstream livelihood opportunities for many women in sludge processing (sludge is a semi-liquid by-product of groundnut processing used in the soap making industry) and marketing in the host and neighboring communities.



Mercy Wakawa

Sixty-year-old trailblazing farmer proves it's never too late to change your mind!

For many years 60-year-old Clement Hange from Mbanor in Konshisha Local Government Area of Benue State, Nigeria, was content with the output from his farm. That was until he was selected as a lead farmer to take care of a demo plot for his farmer group "Hange Multi-Purpose Cooperative Society Ltd." under N2Africa; then he realized that he could do so much better if he changed his farming practices.

"It all started when I attended pre-season training in 2013 that was

organized by one N2Africa partner, MARKETS II, and learned new production technologies for soybean production. I was trained on the best agronomic practices for the cultivation of soybean and received a package of improved seeds, fertilizer, and inoculants, which I planted on the demonstration plot and later in my own farm. The demonstration plot gave me and the group more insights into the use and the benefits of the new technologies," he said.



USAID-MARKETS II Soybean Advisor Emmanuel Abam and Teriyima Iorlamen (Egal) during the joint field inspections.

“My soybean farm was doing very well with the improved practices. The improved variety gave a yield of 1760 kg/ha while I only got 400 kg/ha from the local variety without using the inoculant. Soybean production in the cooperative has improved with the intervention of the project in terms of training and input provision. Now we not only produce but sell as well. MARKETS II has linked us to an organized market to sell our produce—the processors Hule & Sons Limited in Tarka LGA and Seraph Oils Limited in Makurdi through a formal agreement. MARKETS II has also purchased a multipurpose thresher for my group. This has made threshing very easy and we can handle increased production easily,” he said.

In 2016 the cooperative cultivated about 4 ha of soybean while he

cultivated about 6 ha, which he intends to increase to 10 ha in 2018.

In addition to grain production, the group has also been producing and selling seeds to interested farmers in the community.

On their next steps: *“We want to diversify our farming and start cassava production as well as increase the area under soybean production. We are presently discussing with some banks to enable more members to have access to finance to increase their cultivated land under production as well.*

“Thanks to MARKETS II and N2Africa for the immense support and knowledge to help us find our feet.”



Clement Hange with the MARKETS II Communication Officer.

Habakkuk Mijinyawa: From peasant farming to commercial farming

In a small rural community called Dutsen Gaiya located in Kajuru Local Government Area of Kaduna State (Southern Kaduna), lives a young enterprising farmer Habakkuk Mijinyawa. In his thirties and married with children, Habakkuk did not study beyond primary school due to financial constraints. As the first born, he quit school to engage in menial work in the community to support himself rather than depend on his poor parents.

He learnt masonry work, which he did alongside farming. However, he realized that farming was more

profitable so decided to invest more in farming on his parents' land. In 2012, when N2Africa was first introduced in Kajuru LGA, Habakkuk was selected as one of the Project's Lead Farmers and received training and inputs for demonstrations. He has continued to put into practice what he learned with great results.

“I noticed that the soybean variety disseminated by N2Africa in my community outperformed most of the local and other varieties. I therefore decided to preserve the seeds for future use. Honestly, I feel very excited being part of N2Africa.

My earnings have increased, thanks to the Project,” he said.

From soybean sales, he acquired more farm land and cultivated mainly soybean and groundnut. When his father passed on, leaving behind a large family for Habakkuk to care of, he has been able to cope with the added responsibilities through farming. He even completed the family house that his father had started constructing.

Habakkuk attributes his success to N2Africa and the Tropical Legume II project.



Bassey Ukem of N2Africa-Nigeria (left) and Bukar Kaka, project admin assistant (right), interacting with Habakkuk. On the ground is harvested groundnut that is being dried.



Habakkuk Mijinyawa with his three children, two of his brothers, and a sister.