

IITA Board of Trustees spring meeting held in Arusha, Tanzania

The Board of Trustees of [IITA](#) convened in Arusha, Tanzania, from 6 to 10 May, for their annual spring meeting. This was to enable them to familiarize themselves with the Institute's research activities in that part of the country as well as conducting their usual business of keeping abreast of developments at the Institute and guiding its future.

During the meeting, the Board members dedicated one and a half days of their program to tour IITA's research sites and meet partners and the hub management and staff, led by [Victor Manyong](#), Director for IITA Eastern Africa hub, who went all out to prepare for the field visits.

This included a visit to the [Nelson Mandela African Institution of Science and Technology](#)

Continued on page 2



Mr Kalpesh Shah, CEO of A to Z Textile Mills and IITA's DDG-P4D, Kenton Dashiell, after signing the Technology Transfer and Licensing Agreement on AflaSAFE TZ01.

Strengthening collaboration between IITA and NM-AIST

The [Nelson Mandela African Institution of Science and Technology](#) (NM-AIST) and [IITA](#) have renewed their partnership after the heads of the two institutions signed a new Memorandum of Understanding (MoU) on 6 May 2019 that spells out the terms of the collaboration.

In the MoU, which is an update of a previous one signed in 2014, NM-AIST will continue to host IITA's banana breeding program, which is breeding improved, high yielding varieties of the East Africa highland cooking banana and provide office space for the staff and laboratories and fields for banana trials. IITA refurbished a tissue culture laboratory and a screenhouse at the



DG Nteranya Sanginga and NM-AIST Vice Chancellor Prof Emmanuel Luoga after signing and exchanging an MoU to continue collaboration.

university and installed an irrigation system on the university land.

On its part, IITA will continue to support in capacity building efforts, which include supervision of MSc and PhD students and continue to maintain the facilities the university has generously provided.

While making a courtesy call to the VC, Prof Emmanuel Luoga, before the official signing ceremony, Chair of the IITA Board, [Dr Amos NamangaNgogi](#) thanked him for the collaboration with IITA through the years. He said NM-AIST had an important role to play in building the capacity of scientists in Africa to tackle the many challenges facing the continent. He noted capacity building was also an important agenda for IITA as it strived to support African countries in developing their agriculture sector to address hunger and poverty and degraded lands.

“NM-AIST is doing a very good job and making a very important contribution to the future of Africa though building the capacity of future scientists and IITA is happy to

continue its partnership. Thank you for all the good collaboration that IITA has received,” he said.

The signing ceremony was witnessed by all Board members, Senior IITA management

both at the headquarters and the hubs, senior management staff at the university, and the staff of IITA at the university. Also in attendance was Dr Geoffrey Mkamila, the Director General of the [Tanzania Agricultural Research Institute](#) (TARI).



IITA Board of Trustees and senior management touring IITA research facilities and listening to the staff explaining their work.

IITA Board of Trustees spring meeting held in Arusha, Tanzania Continued from page 1

(NM-AIST) where the Vice-Chancellor, Prof Emmanuel Luoga and IITA Director General [Nteranya Sanginga](#) signed a Memorandum of Understanding to continue collaboration. During the event, [Prof Rony Swennen](#), head of IITA’s banana breeding program, made a presentation on IITA activities in central and northern Tanzania to the board members and IITA senior management.

Thereafter they toured the IITA banana research program laboratories and fields and met the team led by Allan Brown, a banana breeder based at NM-AIST, who explained their work.

They also travelled to the Africa RISING research sites in Babati, Manyara Region and met with the project’s staff led by the chief scientist Prof Benda, partners, and beneficiaries of this research project that seeks to sustainably intensify agricultural production to tackle hunger and poverty.

Other events that took place during the Board of Trustees meeting in Arusha was the [official signing of a Technology Transfer and Licensing Agreement \(TTLA\)](#) with a private company, [A to Z Textile Mills Limited](#), on the commercialization of AlfasafeTZ01 in Tanzania. The agreement was signed by the Mr Kalpesh Shah, CEO of A to Z company and IITA Deputy Director General, [Kenton Dashiell](#), during a cocktail ceremony hosted by the Board.

With this, Tanzania joins three other countries, The Gambia, Nigeria, and Senegal, in which IITA has transferred Aflasafe products and technology to a private company for commercialization and distribution to farmers.

The IITA-EA hub also hosted a dinner for the board members, IITA senior management, and all the IITA staff from the hub involved in preparation for the event during which, the hub director, thanked the IITA staff that had worked hard to ensure the board meeting

was a success. The Board members also listened to young upcoming scientists at the hub—Christopher Mutungi, [Everlyne Wosula](#), and Harun Muthuri based in Tanzania and Valentine Nakato based in Uganda.

The IITA Board meets twice a year; the first is usually held in different stations and countries that the Institute is working in to enable the Board members to get first-hand experience of the Institute’s research activities and meet partners. The second meeting is held at IITA headquarters in Ibadan, Nigeria.



Women taking part in an IITA-led component on improving nutrition showing the products they have learned to process to IITA Board of Trustees and senior management touring Africa RISING sites in Babati, Manyara Region.

ACAI combines machine learning, field trial data, and crop models to optimize fertilizer recommendations

The [African Cassava Agronomy Initiative](#) (ACAI) site-specific fertilizer recommendation (FR) tool is built to provide optimized and economically beneficial recommendations to cassava growers. The tool considers local soil data, weather conditions, prices of available fertilizers and cassava root produce, planting and harvest dates, and the investment capacity of the farmer.

ACAI has been conducting nutrient omission trials (NOTs) in Nigeria and Tanzania in collaboration with national research and development partners to find out how cassava responds to nutrients. Results show a large variation in nutrient response indicating the need for site-specific fertilizer recommendations.

To provide site-specific recommendations, ACAI is developing an integrated system using machine learning techniques coupled with process-based crop models. The ACAI team is combining the Light Interception and Utilization model (LINTUL), Quantitative Evaluation of the Fertility of Tropical Soils model (QUEFTS), and economic optimizer algorithms to calibrate the recommendations. The mechanism put in place determines

the soil nutrient supply capacity, yield potential, nutrient-limited yield, and fertilizer rates required to acquire a target yield maximizing net revenue by combining observations from field trials, available GIS data, weather data, and farmers' ability to invest in fertilizer.

Using the QUEFTS model, the soil NPK supply was accurately predicted using the observed yield response in the NOTs. At these locations, the relationship between apparent soil nutrient supply and soil properties obtained from GIS layers from the International Soil Reference and Information Centre (ISRIC) was modeled using machine learning techniques. These models, in turn, were used to predict the soil NPK for the entire target intervention area. These soil properties can sufficiently explain the regional level of soil variation. To explain soil variation at a short range, however, the GIS layers need to be complemented with a local scale soil fertility indicator.

The use of common local soil fertility indicators, such as local soil name, soil depth/color, cropping history, perception of soil fertility, cropping history, manure/fertilizer use, etc., are not sufficiently generic as their predictive ability depends on the local

context. Such indicators are therefore challenging to use in a standardized way. Within ACAI, the current yield was found to be the best generic fertility indicator to adjust the soil nutrient supply at a regional scale to local soil conditions. The resulting FR tool is currently providing site-specific recommendations packaged as an open data kit (ODK) form and can be applied offline in the field on a mobile device. Progress is being made to develop generally accessible versions using IVR, USSD, a mobile app, and printable maps and guides.

One of the major challenges to improve the accuracy of the FR recommendation is the quality of the price data both for the fertilizers and the cassava roots. ACAI is exploring partnerships with various organizations providing digital market information as well as price mapping to provide meaningful default values.

Next steps include validating the FR tool both functionally, verifying whether the recommendations outperform current practices in the field, and architecturally, evaluating the user-friendliness and how the tool can best fit within the dissemination strategy of development partners.



Onsite data gathering by members of the ACAI team.

IITA Scientist speaks on the outcome of applying new tools in cowpea breeding

IITA Cowpea Breeder, [Ousmane Boukar](#), has laid out the details of activities, challenges, and successes of the cowpea breeding project from 2016 to 2018. He outlined these in a presentation titled: "Applying new tools to cowpea genetic improvement," which was part of the contract review seminar held at [IITA-Ibadan](#) on 11 March. He also spoke of plans for improvement in the future.

[Boukar noted that](#), over the last three decades, global cowpea production grew at an average rate of 5%, with 3.5% annual growth in area and 1.5% growth in yield. This means that area expansion accounted for over 70% of the total growth during this period.

He also stated that insect pests such as aphids and the legume pod borer were major challenges to the cowpea breeding process. Other challenges encountered were diseases including bacterial, fungal, and viral diseases; parasitic weeds such as *Striga* and *Alectra*; and abiotic stresses of drought, heat, and low soil fertility. To combat these, various resistance controls were used, resulting in *Striga*, bacterial blight, aphid, and fungal disease resistance in areas around the Sahelian and Sudanian

savannas, for short and medium grain-type cultivars with large white or brown grain. This was also true for medium and late-maturing, dual-purpose cultivars with large white or brown grain in the Guinea Savanna zone.

The objective of introducing new tools to cowpea breeding is to develop improved lines with high stable yield potential, resistance/tolerance to both biotic and abiotic diseases, good adaptation to monocropping and intercropping systems, and grain characteristics preferred by customers and processors. "In order to achieve breeding efficiency, the best area to focus on is breeding strategy and optimization, while for effectiveness, focusing on product design and adoption is important," said Boukar.



Ousmane Boukar giving a presentation on cowpea breeding.



Participants of the cowpea breeding seminar.

Biodiversity focus: The Straw-colored Fruit Bat (*Eidolon helvum*)

The Straw-colored fruit bat (*Eidolon helvum*) is a rapidly declining mammal and has been classified as Near Threatened on the International Union for Conservation of Nature (IUCN) Red List. Despite being an adaptable species, widespread deforestation and hunting for food and medicinal uses are the main causes of declining populations.

Mainly found south of the Sahara, the straw-colored fruit bat is a nocturnal species, foraging mainly on fruit. Within the [IITA-Ibadan Campus](#), this bat is an iconic species in the Tree Heritage Park (THP), a “Noah’s Ark”, where over 100 different species of native fruiting trees have been propagated. It is therefore hardly

surprising that straw-colored fruit bats are found roosting in hundreds of thousands in this area—food resources and safety are a priority!

The IITA-Ibadan Campus is protected against poaching and holds about 350-ha regenerating secondary rainforest, which is

globally recognized as an important site for bird conservation.

The straw-colored fruit bat only spends the dry season in the THP and migrates, probably northward, at the onset of the rains. So, if you want to see this amazing mammal, visit the THP between October and April.



The straw-colored fruit bat, a near threatened mammal. Photo: O. Olubodun

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.