IITA
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IITA and CIMMYT partner with AGRA to strengthen maize production in Africa

Representatives from the Alliance for a Green Revolution in Africa (AGRA), the International Maize and Wheat Improvement Center (CIMMYT), and IITA convened at the seventh African Green Revolution Forum (AGRF), held in Abidjan, Côte d'Ivoire, 4-8 September, to formalize ongoing strategic partnership and strengthen collaboration.

AGRA-IITA-CIMMYT signing of MoU at the AGRF in Abidjan, Côte d'Ivoire.

The three organizations have a shared vision of improving the lives of smallholder farmers, and transforming African agriculture. Kenton Dashiell, IITA Deputy Director General, Partnerships for Delivery; Agnes Kalibata, AGRA President; and Boddupalli M. Prasanna, Director, CGIAR Research Program Maize & Global Maize Program, CIMMYT, signed a memorandum of understanding on behalf of the three organizations as a step in the formation of a new partnership directed at accelerating African agricultural transformation.

Through the MoU, AGRA, IITA, and CIMMYT will work together as a team to assist seed companies in gaining access to financing for production increase and commercialization, in response to increased demand for hybrid seed. Agreement was reached on needs for increasing farmer awareness of the new hybrids, including the establishment of on-farm demonstrations and links to agro-dealers in some Eastern, Western, Southern, and Central African countries.

The collaborative partnership among IITA, CIMMYT, and AGRA will ensure the scaling-up and delivery of seeds of improved high-quality maize varieties, especially hybrid maize seed in 11 African countries, specifically Burkina Faso, Ethiopia, Ghana, Kenya, Malawi, Mali, Mozambique, Nigeria, Rwanda, Tanzania, and Uganda.

CIALCA 2017–2020 science agenda to boost entrepreneurial farming in Central Africa!

The Belgian Directorate-General for Development Cooperation and Humanitarian Aid (DGD) will fund the research program on partnership, capacity building and research of the Consortium for Improving Agriculture-based Livelihoods in Central Africa (CIALCA) toward entrepreneurial farming in Central Africa. The program is slated to run from September 2017 for 4 years with a total budget of $3 million. IITA will collaborate with Bioversity International and Soil and Water Management and Crop Nutrition Subprogramme of the Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture based in Austria.

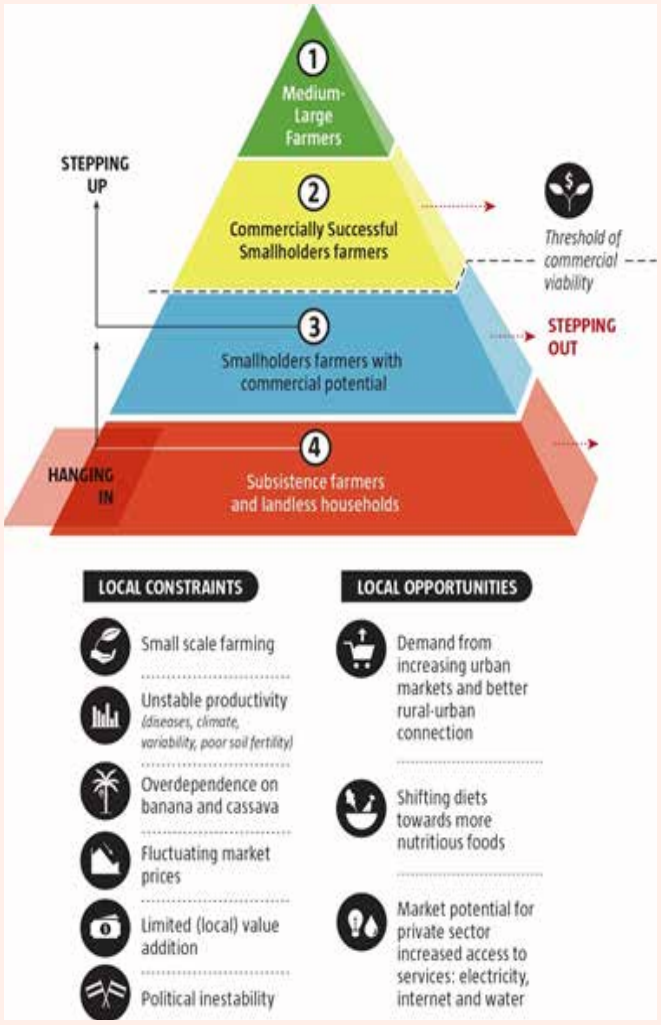
CIALCA has a legacy of improving banana production in the Central Africa region by improving access to clean planting material, and by advancing banana pest and disease control.

The research seeks to examine how policy and partnership between the public and private sector can transform rural African agriculture from subsistence farming to sustainable income-generating farming. CIALCA's research agenda is focused on innovative research in banana- and cassava-based systems that will enhance food-, income-, and nutrition security for farmer groups of different socioeconomic, gender, and age groups. CIALCA will embark on using ICT-based data collection, analyses and information dissemination tools to provide decision-support to farmers, service providers and policy makers. CIALCA is closely collaborating with the national agricultural research systems of Burundi, eastern DR Congo, and Rwanda, and will build science capacity through participatory action research and PhD training in collaboration with Belgian universities.

In an official release on their website, the Belgian MFA committed to supporting CIALCA by citing positive evaluation results that indicated financial improvement for farmers who have worked with CIALCA despite the unfavorable circumstances in Central African areas where CIALCA operates. The fund is part of the Belgian MFA's $10 million funding to the CGIAR as strategic support toward innovative agricultural research.

CIALCA started in 2006 and has since been renewed and reinvented several times to respond to emerging agricultural challenges and opportunities in the Great Lakes Region. Over the 10-year period of research and implementation, CIALCA has registered significant and progressive successes in developing new technologies and innovations, capacity building for adoption and scaling of the technologies, and providing a platform for integrated farming systems used in implementing multi-stakeholder partnership initiatives in the CGIAR.

CIALCA is credited with lifting more than a half a million people out of poverty, and training 10 PhDs and 40 Master's students in Rwanda and DRC, thereby building significant capacity in a region devastated by conflict.



CIALCA seeks to support farmers in stepping up the entrepreneurial farming ladder by addressing local constraints and grasping local opportunities.

IITA conducts CBSD Project Planning Workshop

IITA organized a planning workshop for the 2017–2018 financial year for the project ''Action to control the Cassava Brown Streak in the Democratic Republic of Congo', 29–30 August, in Kisangani, Province of Tshopo''.

This workshop was followed by another one on the ''Harmonization of standards for production and distribution of healthy cuttings of cassava'' held 31 August–1 September.

The first workshop was moderated by the IITA Country Representative in DRC, Nzola Mahungu. It aimed to review the activities planned and approved at the first planning workshop held in Mbanza-Ngungu in April 2017. The workshop also planned activities for the coming 2017–2018 season, and defined the indicators for the evaluation of the project.

The second workshop discussed the harmonization of standards for the production and certification of planting materials.

Dr Liyeye, Provincial Inspector of Agriculture, Fisheries and Livestock for the Province of Tshopo, opened the program, saying that cassava brown streak is the most dangerous disease of cassava, even more than cassava mosaic, since it attacks the most economical part of the plant—the tuberous root. He welcomed the workshop in Kisangani, through which IITA's activities, together with other partners in the cassava sector, will help alleviate the severity and spread of the disease.

Dr Liyeye welcoming participants.

Liyeye said that the provincial government of Tshopo encouraged this initiative and gave reassurances of its full support in its implementation. All the specialized services of the Province would take into account the conclusions and recommendations of the meeting in its development program.

Several participants took part in the workshop, including the representative of USAID and representatives of the Ministry of Agriculture, National Seed Service (SENASEM), and researchers from IITA-DRC (Kinshasa and Bukavu), the National Institute for Agricultural Studies and Research (INERA), and the Universities of Kinshasa and Kisangani. Other partners included the FAO, HarvestPlus, the WAVE Project, the Tshopo Agricultural Support Project (PRODAT), and the Integrated Program for the Rehabilitation of Agriculture in Maniema (PIRAM), and some members of the private sector, including agri-multipliers.

The Cassava brown streak disease project (CBSD-Project) in the DRC is funded by USAID to the tune of US$4.6 million over four years and will operate throughout the country from pilot provinces including the Central Kongo, Tshopo, South and North Kivu, and Kasai/ Lomami.

Dr Nzola Mahungu, IITA DRC Country Representative, explaining the workshop objectives.

Africa RISING success story

Farmer finds a sweet spot producing orange-fleshed sweet potato vines and roots during the dry season in Zambia

Aaron and Mavis Mumba with their two children in front of their house. Photo: Simon Mudenda, CIP.

In the valley in the village of Kasuza in the Eastern Province of Zambia, along the border with Mozambique, Aaron and Mervis Mumba are legends. The couple, who have two children, are "reaping" where "they did not sow".

Through meticulous analysis of the farming season, a careful comparison of the costs of production for maize and orange-fleshed sweet potato (OFSP), certified understanding of the demand and supply market forces at play in their village, and a reliable barter trade system among farmers in their village, this family has hit the jackpot because of shifting to dry-season OFSP farming.

Revelation at first attempt

The Mumbas had always been subsistence farmers, growing various crops such as maize, soybean, cassava, and sweet potato (non-OFSP). Things changed in September 2014 after Aaron joined several other farmers in a partners' meeting organized by the International Potato Center (CIP) and the Zambian Agricultural Research Institute (ZARI). This would mark a shift in his practice of farming—from subsistence to a commercial venture. At the meeting, CIP was recruiting OFSP vine multipliers and Aaron volunteered. The rest is history and Aaron and Mervis have never looked back. They still grow other crops for subsistence needs but OFSP production (for roots and vines) is now their mainstay commercial agricultural venture, thanks to the demand by the community for the great taste and nutritional value of OFSP.

From the family's 1.5 ha piece of land, they grow OFSP variety Olympia on only 0.25 ha. This small area under OFSP offers the most returns, however! At the end of the 2014/2015 season, the Mumbas bartered 200 bags of OFSP vines and roots for 10,000 kg of maize. The prevailing barter exchange terms in that season were a bag of OFSP vines or roots for a 50-kg bag of maize.

"That 2014/2015 season was a revelation to us," Aaron says. "We couldn't have grown and harvested nearly as much maize as I gained from this barter exchange with different farmers in my village. Because the vines and roots were in demand and I was the only supplier, we got very good returns!"

Learning fast, making smart moves

Learning very fast and benefiting from advice offered by the United States Agency for International Development (USAID)-funded Africa RISING going to scale in the Eastern Province of Zambia Project, Aaron and Mervis had an idea. If they could harness the underground water that was easily accessible at their farm, thanks to a high water table, they could start dry-season vine production. This move, they expected, would ensure that they would have vines (in high demand) ready to be bartered to fellow farmers at the onset of the rainy season when a majority of them would again be looking for OFSP vines to plant. At a cost of 400 bundles of OFSP vines, Aaron purchased a treadle pump from the project team and began vine and root production of OFSP under residual moisture and irrigation.

When the 2015/2016 rainy season came, the Mumbas were ready with their full grown vines to barter with their fellow farmers. However, this time it was not a direct exchange of goods because the planting season was just commencing and no farmer had maize to offer in immediate exchange. After agreeing on terms with every interested farmer in the village, Aaron and Mervis supplied the vines ready for planting. During the 2015/2016 harvest season, each farmer came back and settled accounts with them.

Better returns per hectare of OFSP

They have realized that they are better off growing a small portion of OFSP (0.25 ha) which earns them as much as 10,000 kg of maize when bartered (as happened in the 2015/2016 season). According to the Zambian Food Reserve Agency, in that same season (2015/2016) prices ranged between ZMW 85 and ZMW 100 (USD 0.30)/50 kg bag of maize.

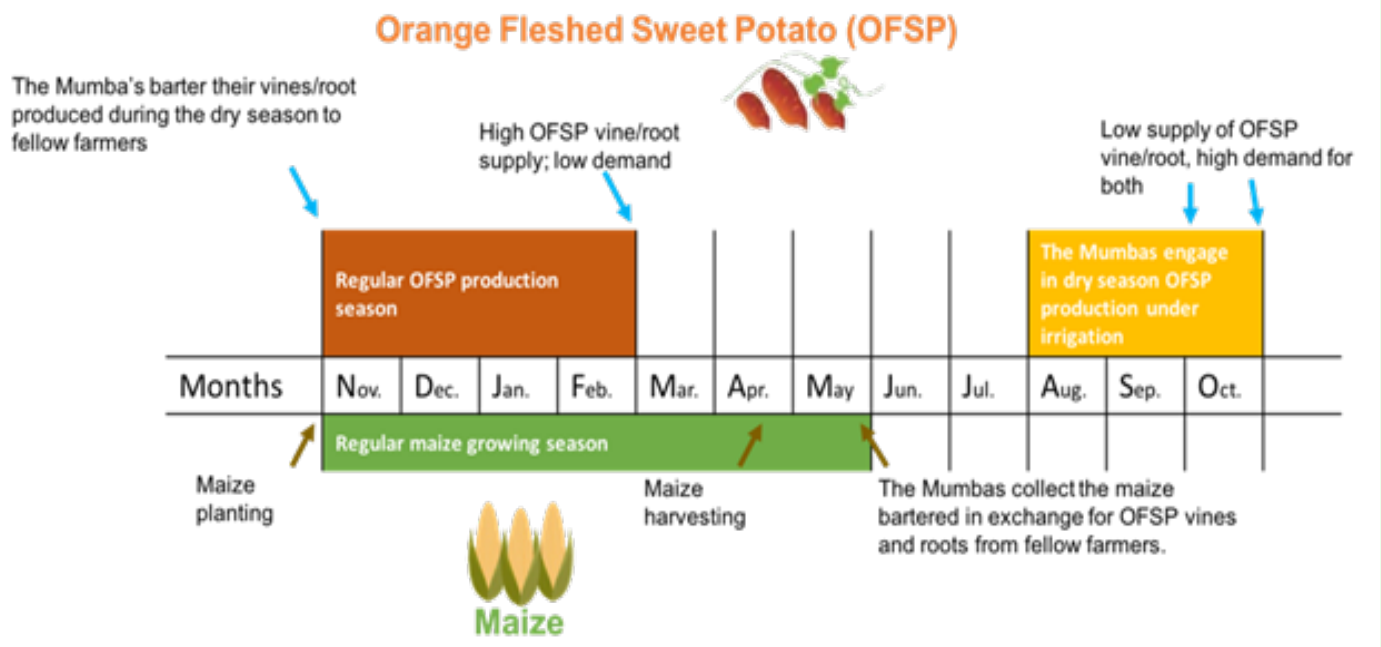
Future outlook in the face of changing weather patterns

The effects of changing weather patterns have, however, not spared the Mumbas. Poor rainfall in the 2015/2016 seasons negatively affected their dry-season production of roots and vines as their shallow wells dried up. Because of low productivity, they earned ZMW 2,550 from bartering only thirty 50-kg bags in 2016 from the dry-season production of the previous season. Still this income was good enough for the family to be able to buy other food stuff that they did not grow that year. For 2017, from OFSP vines produced in the 2016 dry season, they bartered 130 50-kg bags of maize.

"I am thankful that we got into this OFSP vine and root production venture," Mervis says. "It is changing our lives for the better. We have been able to build a house and are now planning to save up and buy a car that will enable us to expand our vine supply even to neighboring villages. We are still learning new things as we go along."

The Mumbas' success story highlights how improved agricultural technologies placed in the hands of innovative "lead" farmers can lead to significant improvement in livelihoods, ensure widespread scaling of improved agricultural technologies, and ensure farmer-friendly value chains that respond to localized community needs' development.

The Africa RISING going to scale in Eastern Province of Zambia project is working to spread the OFSP and other improved agricultural technologies through various approaches and channels. In the OFSP scaling strategy, lead farmers such as Mervis and Aaron are known as decentralized vine multipliers (DVMs) who supply OFSP vine to their "local" communities. Currently the project is working with 214 DVMs through an intricate and strategic network that ensures sweet potato planting material moves from the research stations to the farmers.



A graphic illustration of how the Mumbas make it work. Credit: Jonathan Odhong', IITA.

Comparing the maize and OFSP enterprises, a profitability analysis revealed a higher gross margin for sweet potato (ZMW 33,633.80) than for maize (ZMW –132.85) on a per hectare basis. This indicates a benefit cost ratio of 2.34 for OFSP and –0.09 for maize. Therefore, for every ZMW 1 the Mumbas spend on growing OFSP they gain a benefit of ZMW 2.34 more, unlike their comparative loss of ZMW –0.09 realized from growing maize.

Whole genome reference sequence of yam revealed

Researchers have deciphered the complete sequence of the white Guinea yam.

The white Guinea yam (*Dioscorea rotundata* Poir.) is the dominant African yam. Yam is a major food crop in the tropics providing food and income for some 60 million people.

In many parts of West Africa, food is not considered food if it is not yam. This explains why yam—also called the "king of crops" in Nigeria, is such a prized food.

Despite its social and immense cultural importance, relatively little is known about the white Guinea yam at the genetic level. The white Guinea yam is not widely cultivated, leading to its branding as an "orphan crop."

"The more we understand about the white Guinea yam, the better we will be able to help improve the crop, and help maintain this integral source of nutrition and income in a region undergoing the world's most rapid population explosion—especially as the demand for yam is currently much more than what we are able to supply," said Dr Robert Asiedu, Director for West Africa, IITA, and Yam Breeder for about 20 years.

An international team of scientists from IITA, the Japan International Research Centre for Agricultural Science (JIRCAS), Iwate Biotechnology Research Centre (IBRC), Japan, Earlham Institute and The Sainsbury Laboratory of the United Kingdom, has announced the publication of the full genome sequence of this poorly understood but vitally important crop.

"This is an important breakthrough. It means that yam has joined those crops with a full genome sequence, such as rice and other better-known crops," said Asiedu.

"The implications are profound. Knowing the full DNA sequence will greatly facilitate our understanding of how genetics controls key traits such as flowering, diseases, and others including quality traits, and this in turn will make the breeding of new varieties faster and more precise," he further explains.

"The genome resource will help to overcome the many challenges facing yam farmers in Africa and other parts of the world," said Professor Ryohei Terauchi, Kyoto University and IBRC, study leader and corresponding author. These include pests and diseases, postharvest losses, and the need to develop more climate change resilient and sustainable systems of farming for the crop.

A paper on this breakthrough titled "Genome sequencing of the staple food crop white Guinea yam enables the development of a molecular marker for sex determination," is openly accessible in the journal BMC Biology and the high quality draft genome sequence is available in the public databases DNA Data Bank of Japan (DDBJ) and US National Center for Biotechnology Information (NCBI).

To listen to Dr Asiedu's interview with BBC, click on this link.

White Guinea yam tubers.

Announcements

- **Training workshop on Fall Armyworm (FAW) Management,** IITA, Yaoundé, Cameroon , 2–7 October 2017.
- **Modeling under Climate Change Scenarios Hands-on Training**, Abomey-Calavi, Benin, 16–20 October
- **Basic Bioinformatics Workshop,** IITA, Ibadan, Nigeria, 23–25 October
- **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

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).