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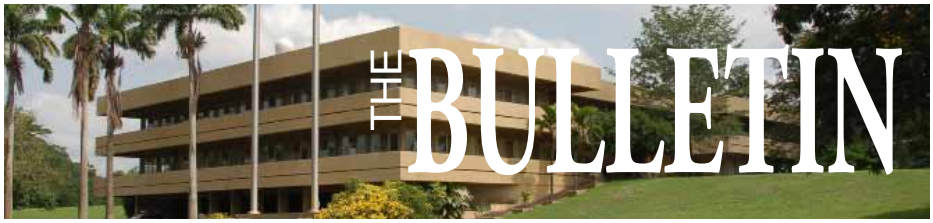

Researchers successfully grow "seed yams in the air"

Researchers at the International Institute of Tropical Agriculture (IITA) have successfully grown seed yams in the air using aeroponics technology, raising hopes and more options for the propagation of virus- and disease-free planting materials.

In preliminary trials, Dr Norbert Maroya, Project Manager for the Bill and Melinda Gates Foundation-funded "Yam Improvement for Incomes and Food Security in West Africa (YIIFSWA) project at IITA, together with a team of scientists successfully propagated yam by directly planting vine cuttings in Aeroponics System (AS) boxes to produce mini-tubers in the air.

Aeroponics System is the process of growing plants in an air or mist environment without the use of soil or an aggregate medium. The technology is widely used by commercial potato seed producers in eastern Africa (Kenya, Uganda, Tanzania etc.), and southern Africa (Mozambique, Malawi etc.) but successfully growing yam on aeroponics is a novelty for rapidly multiplying the much needed clean seed yam tubers in large quantities.

"With this approach we are optimistic that farmers will begin to have clean seed yams for better harvest," Dr Maroya said on Friday.

Preliminary results showed that vine rooting in Aeroponics System had at least 95% success rate compared to vine rooting in carbonized rice husk with a maximum rate of 70%. Rooting time was much shorter in aeroponics.

Aeroponics is coming at an opportune time for African farmers. Traditionally, seed yam production is expensive and inefficient. Farmers save about 25 to 30% of their harvest for planting the same area in the following season, meaning less money in their pockets.

L-R: Dr Maroya, Annang, Asiedu, Aighewi and members of the press at the unveiling of the new seed yam propagation technique in IITA Ibadan

Moreover, these saved seeds are often infested with pathogens that significantly reduce farmers' yield year after year.

However with an established Aeroponics System for seed yam propagation at the premises of an interested private investor, seed company or humanitarian nongovernmental organization; yam producers can have access to clean seed yams.

The soilless yam propagation system will increase the productivity of seed and ware yam and effectively reduce diseases and pests incidence and severity (no soilborne or vector-transmitted pests and diseases during the vegetative phase).

Dr Robert Asiedu, IITA Director for Western Africa described the results as "impressive." "Yam is an important crop in Africa and addressing the seeds' constraint will go a long way in improving the livelihoods of farmers who depend on the crop for their livelihood," he added.

In conducting the aeroponics trial, a special structure was built in an existing screen house with Dixon shelf frames using perforated styrofoam box, as support for plant vines, while the developing roots of the plants in the air were enclosed in conditions of total darkness to simulate the situation of soil to the roots. For the plant and tuber to develop, an automated power house system was established for atomizing periodically nutrient enriched water solution in the form of mist to feed the plants.

Saving Enset–Ethiopia's ancient false banana from deadly bacterial wilt disease

The Ethiopian Institute of Agricultural Research (EIAR) and the International Institute of Tropical Agriculture (IITA) recently launched a new project to improve enset (commonly known as false banana because of its resemblance to the crop but with inedible fruits) by developing varieties with resistance to the deadly bacterial wilt disease. The new project led by IITA seeks to build national scientific capacity—both human and infrastructural—in Ethiopia to conduct biotechnology research on enset to develop varieties that are resistant to the bacterial wilt. It will also help policy makers put in place the necessary Biosafety policies and regulations needed to carry out such research. The four-year US$2.59 million project is funded by the Bill & Melinda Gates Foundation.

The project was officially launched by the Deputy Director of the Ethiopian Institute of Agricultural Research (EIAR) Dr Adugna Wakjira, who noted that while enset was an important indigenous crop in the country enjoyed by nearly all Ethiopians, as there were many, diverse food products made from it, its production was greatly threatened by the banana bacterial wilt. "This project is very timely and relevant to the country as we have to use modern tools in addition to our traditional conventional breeding to solve his problem," he said. Speaking on behalf of IITA, Victor Manyong noted the bacterial wilt was one of the diseases IITA was addressing

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Enset in a farmer's field in Southern Ethiopia. 40-year-old Langano Mamo extracting pulp from enset which is fermented and used to make various traditional dishes.

Got a story to share? Please email it with photos and captions to Andrea Gros (a.gros@cgiar.org), Katherine Lopez (k.lopez@cgiar.org), Jeffrey T. Oliver (j.oliver@cgiar.org), Godwin Atser (g.atser@cgiar.org), or Catherine Njuguna (c.njuguna@cgiar.org).

Cassava Transformation: Breaking the limits of climate change

Dr Okechukwu (second from right), Abubakar (fourth from right) and other farmers at the cassava farm

Scientists from the International Institute of Tropical Agriculture (IITA) Ibadan and partners have successfully established a 100-hectare farm with cassava in Tureta, Sokoto State —one of the semi-arid regions of Nigeria—breaking the barriers posed by climate change, and reinforcing the scientific theory that the root crop could be a lifeline to farmers in drought-prone regions, and even in the face of climate change.

Dr Richardson Okechukwu, Leader of Nigeria's Cassava Transformation Agenda at IITA, who gave technical backstopping to the successful establishment of the cassava farm in that region said, "Results from Sokoto clearly show that cassava is a crop that can guarantee food security in Africa."

"This gives opportunity for farmers in the northern parts of Nigeria to grow cassava and reap the benefits," he added.

Located in northwest Nigeria, Sokoto is characterized by Sahel savanna, and surrounded by isolated hills. The rainy season in the state is from June to October. From late October to February, during the cold season, the climate is dominated by the Harmattan wind blowing Sahara dust over the land. The dust dims the sunlight thereby lowering temperatures significantly and also leading to the inconvenience of dust everywhere in houses.

Despite the limitations of the terrain, farmer Salihu Abubakar of Saajab Farms contacted IITA via the Federal Ministry of Agriculture for help to enable him to establish a cassava farm in the region.

"It was a great challenge … the challenge of water and also that of termites. The first materials we planted were eaten by termites… but we never gave up. The challenge of water was solved through irrigation while we used neem to treat the planting materials," Dr Okechukwu explained.

By taking heed to counsel from researchers, farmer Abubakar is now the owner of a 100-ha cassava farm in one of Nigeria's semi-arid zones, and the farm is expanding.

Farmer Abubakar said he had secured contracts from several countries including China to export cassava chips, and his farm would contribute significantly in meeting the demand.

The success of the farm has been hailed by the State Government with the Governor of the state pledging to support the investment by providing the enabling environment.

The farm successfully demonstrates how a former "waste land" can be converted to productive land, thanks to the Cassava Transformation Agenda and the work of researchers at IITA.

"For me, all I can say is that I am grateful to IITA," farmer Abubakar said.

The 100-ha cassava farm in Sokoto

Saving Enset–Ethiopia's ancient false banana from deadly bacterial wilt disease

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as a priority due to the havoc it had caused on banana and enset, which are important staple and income crops for millions of smallholder farmers in Eastern Africa. He said IITA was honored to work with the Ethiopian researchers to tackle the problem. He also thanked the Gates Foundation for funding the project. Scientists from IITA and the National Research Organization (NARO), Uganda, have successfully transferred genes from sweet pepper resistant to the disease to some popular banana varieties in the country and they have shown very strong resistance to the disease in the lab, in screenhouses, and in confined field trials. The genes plant ferredoxin-like amphipathic protein (Pflp) and hypersensitive response-assisting protein (Hrap) were acquired from Academia Sinica Taiwan through the African Agriculture Technology Foundation (AATF).The project therefore seeks to work with Ethiopian researchers to transfer this technology to enset. "We have made great strides in banana transformation to develop varieties resistant to the disease using genes from sweet pepper as there are no known sources of resistance in both banana and enset. We are keen to extend these technologies to enset at the request of the national scientists," said Leena Tripathi, IITA Plant Biotechnologist who will lead the project. "We look forward to building the capacity of our national researchers to conduct genetic engineering research and build capacity of policy makers to ensure all necessary policies are in place for such work," said Belayneh Admassu, National Coordinator for Agricultural Biotechnology Research Program, EIAR and lead for the project on the Ethiopian side.

Announcement

The Communication Unit wishes to inform you that the weekly IITA Bulletin will not be published until 10 January 2014.
We thank you so much for your support and we cherish your feedback which helped in improving the Bulletin throughout the year.
We wish you a refreshing Christmas and a prosperous New Year in advance.
Godwin Atser on behalf of Andrea Gros, Head of Communication.