

# Banana and plantain improvement



With support from



## Project context

Bananas (*Musa* spp.), including dessert banana, plantain and cooking banana are the eighth most important food crop in the world, and the fourth most important in least developed countries (FAOSTAT, 2013). They are produced in 135 countries and territories across the tropics and subtropics. The vast majority of producers are smallholder farmers who grow the crop for either home consumption or local markets. Less than 15 per cent of the global production of more than 130 million metric tons is exported. Today, the international banana trade, totaling around 17 million metric tons, is worth over US\$7 billion per year (FAOSTAT).

Africa produces one-third of all bananas and plantains in the world. In West and Central Africa these are plantains while in Eastern Africa these are highland cooking and beer bananas. There are about 120 plantain varieties and 70 highland bananas. All suffer from nematodes, weevils, and black Sigatoka.

Current yields of plantains are 7 tons per hectare while potential yield is 20 tons per hectare. For highland bananas, current yields are 5-30 tons per hectare while potential yield is 70 tons per hectare.

The low yield is especially linked to the poor soil base and the inaccessibility of improved varieties. IITA however has done more than 20 years' research in banana and plantain agronomy and integrated soil fertility management (ISFM) and agroforestry research and has developed 19 superior PITA (plantain hybrids) and 27 NARITA (highland banana hybrids in collaboration with the National Agriculture Research Organization, NARO, Uganda). PITA produces up to 15-20 times more than the land variety while NARITA can produce up to 4 times more. These hybrids have been distributed to West Africa (Benin, Ghana, Nigeria, Ivory Coast), Central (DR Congo) and Eastern Africa (Burundi, Comoros, Rwanda, Tanzania and Uganda) and are awaiting local evaluation.

The European Commission has funded over €200 million in research in collaboration with IFAD and the CGIAR system to increase the resilience of smallholder farmers to climate change and to improve food security. Projects have been undertaken in many countries to bring the power of science to bear on developing solutions that can be scaled up to reach millions of people.

IITA conducts research that provides solutions to nourish Africa. We work with public and private sector partners to address the problems of hunger, poverty, and degradation of natural resources in the tropics. We are a member of the CGIAR Consortium, a global research partnership for a food secure future.



## The research programme in brief

Banana and plantain seed systems in each country are in the process of being established. These would provide healthy indexed plants, multiply plant material at a very high scale, and provide good nursery practices. The seed systems are linked to ISFM practices to maintain sustainable and high banana-based production systems.

On-farm participatory variety selection (PVS) trials also have been conducted to select the best performing varieties in terms of taste, yield, and yield stability and to provide breeders feedback on farmers' criteria when selecting adaptable varieties.

## Results and impact

From the trial results, the hybrid varieties performed better than the local check across all traits being evaluated. For example, 96 per cent of the hybrids had a bunch weight greater than that of the local check. The bunch weight varied up to 28.4 kg, with an overall mean of 18.3 kg.

In West and Central African 70 million plantain farmers stand to gain from this effort in the longer term; while in eastern Africa about 20 million banana farmers should benefit.

The preliminary results therefore show that these hybrids have potential to increase banana production in Uganda, Tanzania, and the highlands of East Africa. Further testing is now planned in Uganda and Tanzania across multiple locations and involving farmers to assess performance on farmers' fields.

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