

GOING BANANAS

Evolution, pests and diseases are threatening the banana with **EXTINCTION**, so a global network of researchers is working to keep it alive.

text Liz Ng'ang'a

EACH DAY in Uganda, Brigitte Uwimana, a Banana Molecular Breeder at the International Institute of Tropical Agriculture (IITA), leads a team of researchers as they breed bananas using the fruit's genetic signatures and evaluate resulting new varieties. Meanwhile, Rony Swennen, a Banana Breeder at IITA in Tanzania, and his team are painstakingly studying variations in different types of banana and plantain, which is mostly roasted. Both teams are components of a pipeline that's determined to improve banana production in Africa through the Breeding Better Bananas project, an initiative that's bringing together researchers from the US, Africa, Europe, Australia, Asia and South America.

TAKEN FOR GRANTED

To many of us in Africa, the banana is a handy snack, the weaning food for infants and an omnipresent feature of our hillsides. In fact, it's a staple food crop for millions of people here. It also prevents soil erosion, and provides the raw material for a range of products, such as bread, thatching and Uganda's beloved national spirit: *Waragi*.

The banana value chain in Africa encompasses diverse actors: producers, middlemen, transporters, market traders and end-product processors. And while statistics are obscure, the banana is a key commodity in intra-Africa trade, with the crop expected to benefit from initiatives such as the African Continental Free Trade Area. Exports from Africa to international markets are also difficult to document. However, African dessert bananas can be found in supermarkets, while cooking bananas and plantains find their way to niche corner shops targeting African clientele abroad. Indeed, due to its economic potential, African countries have begun in earnest, developing value chains that will elevate the banana to its rightful role as a cash crop.

In reality, Africa's banana sector is producing a mere fraction of its potential as a result of factors that include pests, mainly weevils and soil-dwelling worms known as nematodes, as well as diseases such as black Sigatoka and fusarium wilt, contagious fungal diseases that are capable of destroying plantations.

GONE BANANAS?

According to the Breeding Better Bananas team, this scenario can be reversed by developing resistant varieties. But, the banana is the most difficult crop to breed due to an evolutionary process that has led to reports predicting its imminent extinction.

"Alarmist as these reports might seem, there is some truth in them," says Swennen. "Bananas are a scientific paradox having reached an evolutionary dead end. In fact, the fruits that we consume today are seedless and sexually sterile. And yet, this sterility is a blessing in disguise. Banana seeds resemble ball-bearings, which would make eating the fruit an oral juggle."

"Breeding bananas involves a return to the inedible-yet-fertile, seed-producing ancestral varieties, and then cross-pollinating them to produce infertile hybrids that are resistant to pests and diseases, are edible and retain the acceptable attributes of the fruit," says Jerome Kubiriba, Head of the Banana Programme at National Agricultural Research Organisation (NARO), Uganda. The result should be better yields and improved returns for growers through a collaboration between researchers, farmers, government officials and the private sector.

The Breeding Better Bananas team has the advantage of networks and experience. Swennen has been breeding bananas for 40 years, and he's spent a significant amount of that time at IITA. In 1987, IITA commenced a breeding programme for resistance against black Sigatoka disease in plantain. Through the West Africa Agricultural Productivity Program, resistant plantain hybrids were developed, and between 2012 and 2016, they were distributed to farmers in several West African countries.

"I started cultivation on a small plot," says Kassongo Sylvie from Burkina Faso, one of the first producers of the new breeds. "Five years later, I have expanded production to two hectares. My earnings have increased tremendously."

"Before the introduction of these varieties, plantain cultivation was rare in Burkina Faso. Now, we have a thriving sector," says Paul Iboudou, Research Technician at the Environment and Agricultural Research Institute of Burkina Faso.

In the mid 1990s, IITA began breeding the Matooke – a green cooking >

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Harvesting bananas

The process of harvesting bananas is very labour-intensive because they have to be handpicked and each bunch is quite heavy. It's also sweaty work as bananas need a warm climate (and fertile soil) to grow well and produce a good yield.



Union. “It will help to address one of the major challenges we face: the short lifespan of our plantations, which succumb to diseases in less than four years, way before we are able to make any profit.”

In partnership with the Tanzania Agricultural Research Institute, the project established the first-ever banana breeding facility in Tanzania. Situated at the Nelson Mandela African Institute of Science and Technology in Arusha, the facility was established in 2014 and focusses on Mchare, a type of cooking banana. Over the past five years, the necessary infrastructure has been established and progress has been made in the initial research stages.

The hybrids developed in Uganda and Tanzania will be disseminated for the benefit of farmers across Sub-Saharan Africa. But, a key challenge remains in accelerating the slow business of breeding bananas. And this is where the true benefit of partnerships is most visible. Researchers in the Czech Republic and the US are using state-of-the-art techniques and equipment to unravel the genetic coding of the Mchare and Matooke varieties, while in Australia, researchers are identifying genetic markers that will enable breeders in Africa to rapidly scan a vast array of plants for resistance. Meanwhile, partners in India, Malaysia and Brazil are providing banana material for use in breeding, while a specialised laboratory in South Africa is screening plants for resistance and mitigating against the very possible threat of Fusarium wilt tropical race 4 (TR4), one

banana – in partnership with NARO. “We have made exciting progress, and we now have six potential hybrids, dubbed NARITAs, which are currently undergoing field evaluation in East Africa,” says Robooni Tumuhimbise, Senior Plant Breeder at NARO. “We are using our existing testing network across the country to test the aspects that define a good

BANANA STATISTICS

1 – The importance of the banana as a food crop in Rwanda compared to other food crops

15 – East Africans consume 15 times more bananas than the rest of the world

200 – The amount of bananas (in kgs) consumed, on average, by Ugandans each year

1,000 – The approximate number of banana varieties

2.4 MILLION – The area in hectares that’s covered by banana plantations in East and Central Africa

90 MILLION – The number of resource-poor farmers who are dependent on bananas in Africa

4.3 BILLION – The estimated US\$ value of the whole banana economy in East and Central Africa

44.1 BILLION – The global economic value of bananas in US\$

“The hybrids developed in Uganda and Tanzania will ultimately be disseminated for the benefit of farmers across the region”

banana for consumers; namely taste, texture and aroma, and colour retention once cooked.”

The current banana production in Uganda is around 15 tonnes per hectare, compared to a potential of 60-70 tonnes. It’s hoped that the new hybrids, combined with better agronomic practices, will help to reduce this gap.

“This initiative merges with our ambitions as producers for more successful banana production,” says Kataratambi Silver, a member of the Uganda Banana Producers Cooperative

of the world’s most dangerous crop diseases.

“It took 27 years for us to deliver new banana varieties to farmers in West Africa,” says Swennen. “The new technologies, network and tools we have accumulated at Breeding Better Bananas will enable us to shorten this time span by between 5 and 10 years.”

As he concludes, the Breeding Better Bananas project involves a continuous fight against time; requiring a daily focus on the long term and ability not to lose the vision or become sidetracked.

Table Mountain

With its unusual shape, the flat-topped Table Mountain is befittingly one of the New 7 Wonders of Nature. At this prominent landmark, there are lots of stimulating activities to experience. Here are our favourites.

Cableway to Heaven

This cableway is one of a kind, as it is the only one in Africa with a rotating cable car. The ride carries approximately one million visitors each year to the Table Mountain plateau, where they can venture out into nature. Although experts can’t seem to agree on the mountain’s height – it ranges from 1,085 to 1,087 m above sea level – one thing is crystal-clear: the awe-inspiring viewpoint is definitely worth the ride.

Abseiling Adventure

The breathtaking views from the top of Table Mountain are impressive, no doubt about it. However, if you’re in for a thrill, there’s one way of getting an even better view: by going down the side of a sheer cliff and enjoying the landscape while hanging from a rope. So, harness up and drop down; if you dare.

Nature Walk

Adjacent to the eastern slopes of Table Mountain is The Kirstenbosch National Botanical Garden. Not only does it offer an incredible natural area that can be explored via a number of walks and trails, the garden is also a perfect setting for art. With numerous outdoor exhibitions as well as indoor art shows, it’s a feast for the eyes. On top of that, you can also spot a wide variety of indigenous birds, reptiles, frogs and invertebrates here.

Oudekraal Beach

Tucked away in a cove is one of Cape Town’s best-kept secrets, Oudekraal Beach. As part of the Table Mountain National Park area, this secluded beach offers a unique experience. Here, you can take a dip in the calm waters, do some snorkelling or take a diving lesson. Furthermore, the beach offers a stunning landscape that will serve as the perfect background for an Instagram picture.

Text: Raissa Velano de Santana. Image: Getty Images