An African Consortium for Fusarium wilt mitigation (AC4TR4) established to address the introduction of Foc TR4 into Africa

An African consortium (AC4TR4), consisting of experienced banana scientists, was mobilized in November 2013 to deal with Foc TR4 (*Fusarium oxysporum* f. sp. *cubense* ‘tropical’ race 4) in Africa following its discovery in a plantation of export Cavendish bananas in northern Mozambique. AC4TR4 consists of Stellenbosch University, IITA, Bioversity, Matanusa, NPPOs, NARs and other role players on the continent. Foc TR4 is one of many strains responsible for *Fusarium wilt*, a destructive disease commonly known as Panama disease. “How and when it was introduced is not known, but our priority is to contain the disease and to prevent the fungus from spreading to other areas in Africa”, says Eldad Karamura, Bioversity scientist and coordinator of the Banana Research Network for Eastern and Southern Africa, BARNESA.

Panama disease is not new to the African continent. As Bioversity scientist Guy Blomme found out while researching a historical review on the introduction and spread of banana pests and pathogens on the African continent, several independent introductions of what became known as Foc race 1 occurred between 1924 and 1986. With one possible exception, the fungus was unwittingly introduced in infected planting material. Once in the continent, the fungus was spread through contaminated tools, water and soil. In Africa, however, the devastation has not been as great as in Latin America, where several of the continent’s popular bananas turned out to be susceptible to not only to Foc race 1 (Gros Michel, Silk, Pome), but also to Foc race 2 (Bluggoe). “The main reason is that the locally domesticated East African highland bananas and African Plantains, two groups of widely grown cooking bananas, are resistant to Foc race 1”, says Fen Beed, an IITA plant pathologist based in Tanzania. The worst losses have been caused by Foc race 1 strains attacking the juicing banana Kayinja and by a ‘subtropical’ form of Foc race 4 found only in the Cavendish plantations of South Africa, where the less favorable growing conditions are predisposing the infected plants to damage that would not normally develop.

Foc TR4 differs from the subtropical strain found in South Africa in that it does not require any predisposing factors to cause disease, explains Altus Viljoen from Stellenbosch University, whose research group confirmed the identity of the fungus in Nampula, Mozambique. The Asian outbreaks have also shown that, in addition to Cavendish bananas, Foc TR4 affects some banana cultivars susceptible to Foc races 1 and 2. However, since EAHBs and African plantains are not grown in Southeast Asia, their reaction to the virulent strain is largely unknown.
To help assess the risk Foc TR4 presents to African farmers, Bioversity and Stellenbosch University took a dozen or so African plantains and EAHBs to China and the Philippines in 2011, where local partners evaluated their reaction to Foc TR4. Most of the cultivars showed good levels of field resistance, but Gus Molina, the Bioversity scientist and coordinator of the Banana Asia-Pacific Network BAPNET who oversaw the project, recommends that more African cultivars be evaluated over a longer period to fully establish the potential effect of Foc TR4 on the staple food of millions of Africans. Some of the banana hybrids produced by IITA and NARO, Uganda’s National Agricultural Research Organization, therefore, will be field tested in Asia for resistance to Foc TR4.

Meanwhile, a team of plant pathologists, horticulturists, breeders and soil scientists developed, in collaboration with NARS and regional authorities, a containment strategy for the affected Cavendish banana farm. The plan will also include recommendations to prevent the spread of the fungus to the region and continent as a whole. According to Serafina Mangana from the Departamento de Sanidade Vegetal-MINAG, in-country quarantine measures will be introduced in Mozambique and the outbreak in Namialo will be closely monitored. “We have a good team on board”, Eldad Karamura says, “and we are determined to not allow this introduction to threaten the livelihoods and food of Africans.”

For further information on the activities of AC4TR4 in Africa, contact Dr Fen Beed (email: f.beed@cgiar.org).