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By Carl Collen

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KeyGene and WUR join banana battle

Wageningen University & Research and KeyGene to contribute to African banana varieties resistant to Panama disease



Wageningen University & Research (WUR) and crop innovation company KeyGene have announced that they have joined the international research programme Accelerated Breeding of Better Bananas (ABBB).

With their research, WUR and KeyGene are aiming to contribute to the development of new East African highland banana varieties having resistance to the devastating Panama disease, crucial for African farmers and communities as the banana is a crucial part of the local diet.

The research at WUR and KeyGene is financed by the Bill & Melinda Gates Foundation. The research teams involved will be working together very closely, while also collaborating with the overall coordinator of ABBB, the International Institute of Tropical Agriculture (IITA).

The banana is currently under attack from a *Fusarium*-species, commonly called Tropical Race 4, or TR4.

This fungus kills many genotypes of banana, including the most important global export variety Cavendish, which makes up some 95 per cent of the world's international trade in bananas and 50 per cent of global production.

The devastating disease is called fusarium wilt of banana (FWB), or Panama disease, and is spreading across the globe at an increasing pace.

The situation is comparable to the first epidemic caused by so-called Race 1 that completely destroyed the cultivation of the then popular banana variety Gros Michel during the 1950's in Central America.

Developing better varieties is expensive, time consuming and requires substantial land area, and this is why ABBB first came into force, thanks to the Bill & Melinda Gates Foundation and instigated by the International Institute of Tropical Agriculture (IITA).

The ABBB programme focuses on

improving the production and productivity of banana in the East African highlands by improving breeding programmes aimed at the development of new banana cultivars as well as local crop management and disease control systems.

WUR and KeyGene are now joining the ABBB programme, adding their unique technology, knowledge, expertise and research facilities.

First of all, the joint WUR/KeyGene team wants to develop so-called molecular markers that will enable more effective breeding of East African highland bananas with resistance against TR4.

Using these molecular markers, breeders can select the seedlings for which the DNA test predicts the plant will be resistant to TR4.

The team will then identify the genes that make banana plants resistant to TR4 as well as to Race 1, which is a prerequisite for any new banana variety.

"We are very pleased that we can exploit all that the so-called Race 1 consists of a at WUR has a great track record in

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of the DNA technology, bioinformatics power and expertise in marker development at KeyGene to contribute to the development of resistant varieties of a crop that is so enormously important for food and income in Africa," said Anker Sørensen, vice-president of new business and coordinator banana research at KeyGene.

Earlier research showed

complex mix of several different Fusarium species, and TR4 is actually a different species.

This diversity of fungi likely uses effector proteins, which interfere with the plant's immune system and are therefore crucial for disease and resistance.

"The Laboratory of Phytopathology

identifying and studying effectors," added Gert Kema, professor in tropical phytopathology at WUR. "We are proud to now use our expertise and our research power to support banana breeding in Africa."