

East Africa: GM Banana Resistant to Fungus Shows Promise

- John Kasozi and Joyceline Edwards, All Africa, April 20, 2011

Kampala - A banana strain resistant to a common fungal disease could help smallholder farmers in East Africa better control the crippling disease, which has been spreading across the region over the last three decades.

The results of confined field trials of a genetically modified (GM) banana with improved resistance to a black sigatoga disease, the devastating leaf spot fungus, are promising, researchers have told SciDev.Net.

The disease is caused by the fungus *Mycosphaerella fijiensis* and it can halve fruit production in affected plantations. It is easily spread by airborne spores, rain, planting material, irrigation water and packing material used in transporting goods between banana-growing countries.

The dark leaf spots caused by the fungus eventually enlarge and merge together, causing much of the leaf area to dry.

The team led by Andrew Kiggundu - head of banana biotechnology research at the Uganda's National Agricultural Research Laboratories Institute (NARL) in Kawanda - analysed 19 lines of GM bananas and found promising results in five of them. Andrews told SciDev.Net further research is needed to calculate the exact yield gains from using the resistant banana strain.

The researchers inserted genes for chitinase - an enzyme that breaks down chitin, the hard substance that makes up the cell walls of the invading fungi - preventing the fungus from invading the plant cells and causing the disease.

Kiggundu said laboratory tests using leaves from transgenic plants showed almost full immunity when cultured fungi were applied to the leaves.

Researchers collaborated closely with the Catholic University of Leuven in Belgium, where several banana lines were engineered to include the chitinase gene before being brought to NARL for testing.

However, Settumba Mukasa, resident banana expert in the department of crop science at Uganda's Makerere University, said the field trials had more significance for building research capacity in Uganda than the development of a new disease-resistant banana.

"[The project] is a stepping stone for subsequent breeding programs and genetic engineering programmes. As a consequence of this project we can now do transformations of other varieties of bananas and other crop species," said Mukasa.

While black sigatoka is among the top three diseases affecting bananas in Uganda it mainly affects Cavendish, which are not as widely cultivated as other types of bananas.

But for the few farmers in Uganda who do grow Cavendish bananas, the development may be useful since the disease is currently controlled by aerial pesticide spraying which is expensive for smallholders and affects their health.

"Farmers cannot afford that because they are small and they have few plants. Here, chemical control is not viable, so this approach may be the only available method to manage the disease," Mukasa said.

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