

## Uganda GM banana fails to defeat diseases

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A field trial of a Genetically-Modified (GM) banana variety in Uganda has failed to defeat the occurrence of banana diseases. The variety was attacked by Black Sigatoka disease, which can cut a banana tree's fruit production by half.

Scientists at Kawanda National Agricultural Research laboratories had hoped the modified banana would help reduce the occurrence of banana diseases. Local banana varieties are vulnerable to numerous diseases and pests, including the banana bacterial wilt disease and weevils. Bacterial Wilt hit Uganda in 2001, destroying most plantations and, it is estimated, causing losses of up to \$35m (sh57b). Dr Andrew Kiggundu, the research team leader, said they were changing strategy to ensure that the GM banana's resistance would be enhanced. He told a science reporters' meeting at Shanghai Restaurant in Kampala recently that an anti- Black Sigatoka gene was inserted in parts of the GM banana seedlings to control the disease.

"Depending on where the gene was inserted, it expressed itself inside the crop in a different manner. Our next target will be to see which crop exhibits stronger resistance when the gene is inserted and then we can conduct more experiments," Kiggundu noted.

He explained that Uganda's GM banana research was still in its infancy. "We are still at a stage where one gene can be introduced. We shall soon acquire dual gene introduction mechanisms," he noted.

"The dual gene technology would enable scientists to introduce multiple genes for desired traits in a single variety, before releasing it for farming. Some of the traits include multiple disease and drought resistance, quick maturity and high production.

Black Sigatoka, which is also known as black leaf streak, causes significant reductions in leaf area, yield losses of 50% or more, and premature ripening, a serious defect in exported fruit. It is more damaging and difficult to control than the related yellow Sigatoka disease, and has a wider host range that includes the plantains and dessert and ABB cooking bananas that are usually not affected by yellow Sigatoka. The high rainfall and humidity of the tropical regions in which bananas are grown are especially favourable for disease development. The fungus that causes Black Sigatoka is spread from tree to tree by wind, rain and irrigation water. Kiggundu said Black Sigatoka was endemic in almost all the banana growing areas. It has crippled banana production in the central region around Lake Victoria, eastern region and some parts of the north.

The banana research programme has set up a frontline in Bushenyi district to stop the disease from attacking western Uganda, Kiggundu added. The new banana variety was hoped to help tackle the expense of protecting bananas from this disease. Black Sigatoka is controlled with frequent applications of fungicides and cultural practices, such as the removal of affected leaves, and adequate spacing of plants and efficient drainage within plantation. For example, fungicide application includes the use of airplanes or helicopters, permanent landing strips and facilities for mixing and loading the fungicides, and the high recurring expense of the spray materials themselves. In total, it has been estimated that the costs of control are ultimately responsible for 15-20% of the final retail price of these fruit in the importing countries. Their great expense makes them essentially unavailable to small-holder farmers, especially prolific in Sub Saharan Africa, who grow this crop. It is these producers who are affected most by this important disease.

The Ugandan scientists carrying out a field trial said it was too early to say that the bananas last year had failed.