First all-African GM crop is resistant to maize streak virus

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Maize streak virus symptoms in a commercial maize field in Klerksdorp, NorthWest South Africa, showing chlorotic streaking and deformed cob development. This farm grew USA commercial hybrids and experienced almost total yield losses. Credit: Photograph taken in April 2005 by Dr F. Kloppers

The first all-African genetically modified crop plant with resistance to the severe maize streak virus (MSV), which seriously reduces the continent's maize yield, has been developed by scientists from the University of Cape Town and PANNAR PTY Ltd, a South African seed company.

The research, published in *Plant Biotechnology Journal* represents a significant advance in African agricultural biotechnology, and will play an important role in alleviating Africa's food shortages and famine.

Dr Dionne Shepherd, lead researcher explains, “MSV is transmitted to maize by small insects called leafhoppers. The disease is therefore a result of a complex interplay between the plant, the virus and insect. Factors that can influence the severity of the disease include the age at which the plant is infected (the younger the plant, the more severe the infection), the maize variety (some are more susceptible than others), and environmental conditions.

“We have created an MSV-resistant maize variety by genetic engineering, using an approach known as pathogen-derived resistance. This means that a gene from the viral pathogen is used to protect the plant from that pathogen. We mutated a viral gene that under normal circumstances produces a protein that is essential for the virus to replicate itself and inserted it into the maize plant’s genome, creating genetically modified maize. When the virus infects one of these transgenic maize plants, it displays a significant delay in symptom development, a decrease in symptom severity and higher survival rates than non-transgenic plants.”

The next stage of the research involves field trials to ensure that the transformed crop is digestible, that the protein is not an allergen and that it will be ecologically friendly to other organisms within the environment. Following the results of these trials, the crop will be monitored over a number of growing seasons before it is made accessible to local farmers.

Source: Blackwell Publishing