

Scientists make breakthrough in fight against cassava diseases

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Scientists have identified the first ever genetic markers associated with resistance to two deadly cassava viral diseases in Tanzania's grown varieties. The International Institute for Tropical Agriculture (IITA), in a statement availed to the 'Daily News', identified the two varieties as Namikonga and Albert.



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Mostly grown by Tanzanian farmers, the varieties are capable of withstanding the devastating Cassava Brown Streak Disease (CBSD) and Cassava Mosaic Disease (CMD), unlike other varieties.

A team of scientists that have been studying the varieties' DNA has successfully identified the genetic markers linked to their resistance to each of the viral diseases. The markers can be used to speed up the often long and expensive conventional breeding for cassava varieties with dual resistance to the diseases. "We are very happy with the findings of our studies which are a result of over six years of research.

An important milestone in the efforts to revive cassava production

"It is an important milestone in the efforts to revive cassava production in East, Central and Southern Africa where the two diseases remain a serious problem, threatening the region's food security," said Morag Ferguson, a molecular breeder at IITA.

Ferguson said for West Africa, where there is a great fear of CBSD spreading and with devastating effects on the food security, the markers can assist in pre-emptive breeding.

Namikonga and Albert, which are genetically related, have been grown by farmers in areas that are hotspots for the two viral diseases for many decades and have shown high resistance despite being subjected to the diseases for a long period. Namikonga is tolerant to CBSD but highly susceptible to CMD while in contrast, Albert is highly susceptible to CBSD but resistant to CMD.

The international team, drawing scientists from Tanzania, Kenya, South Africa, and the United States, crossed the two Tanzanian varieties and studied a large population of the progeny over two seasons in two disease hotspots in the country.

"The studies have enabled us to better understand the location of genes we suspect are associated with resistance to CBSD in the DNA of the farmer-preferred cassava variety, Namikonga, and CMD in the variety Albert," noted Esther Masumba, the molecular breeder from the Ministry of Agriculture, Livestock and Fisheries.

Speeding up breeding

She added, "Once validated, this will help speed up breeding through marker-assisted selection (MAS) which shortens the breeding cycle and reduces the offspring population that breeders have to work with.

Breeders will be able to quickly narrow down from the thousands of offspring to only those with the desired markers." She was part of the research team and conducted the study as part of her PhD studies at the University of Pretoria, South Africa.

Most of the cassava breeding programmes in Africa use purely conventional breeding methods that are laborious and expensive due to long breeding cycles and the need for large field trials. The application of molecular markers in breeding and selection of crop varieties can both reduce the breeding time and costs.

The research team will now continue to validate these markers for their applicability in marker assisted breeding (MAB).

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