Gene discovery could fight cassava disease, increase food security

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The discovery of a gene resistant to the virus that causes the devastating cassava mosaic disease could aid the development of disease-resistant cassava varieties and boost food security in Sub-Saharan Africa, scientists say.

In Sub-Saharan Africa, cassava farming is constrained by weeds and

viral diseases, particularly the cassava mosaic disease, caused by a group of viruses called geminiviruses.

Cassava mosaic disease is responsible for the loss of more than 80% of cassava crops, a staple for more than 800 million people in Sub-Saharan Africa.

Researchers say it was farmers in West Africa who noticed that while the majority of their cassava plants in the field had died as a result of the viral infection, a few plants survived.

"Understanding the genetic resources for resistance to geminiviruses is therefore important to secure yields for cassava farmers," says Wilhelm Gruissem, one of the researchers that made the discovery documented in Nature Communications in July.

Gruissem, professor of plant biotechnology at ETH Zurich, in Switzerland, tells SciDev.Net that the cassava mosaic disease in Africa causes significant yield losses in Sub-Saharan Africa and is spreading to India and other parts or South East Asia.

Silver lining

Titus Alicai, a co-author of the study and a plant virologist at the National Crops Resources Research Institute in Uganda, tells SciDev.Net that this finding means that government can develop and fund strategies to curb the disease.

"With the results, genetic markers which are tightly linked to cassava mosaic disease resistance can now be developed," he said.

"This will make the selection of promising lines during new cassava variety development precise, efficient and timely by enabling DNA-

based screening of large populations within a few months rather than a whole year at each stage," he explains, adding that conventional breeding of new cassava varieties typically takes eight to ten years. Alicai says the finding can be used by policymakers to develop or improve action plans for the control of other viral diseases ravaging cassava in Africa.

He believes that the results may trigger similar discoveries critical for controlling related viruses affecting other crops.

"Our results provide evidence that can inform policymakers' decisions for increased funding support to science, technology and innovations for plant health management," he says.

Alfred Dixon, cassava specialist at the International Institute of Tropical Agriculture in Nigeria, agrees. He says 12–82% of cassava is lost to cassava mosaic disease.

"This is excellent research that will further build resilience in the seed system of cassava," he said.

"A do-nothing approach will mean that 800 million people's livelihoods are in danger and may be jeopardized," he tells SciDev.Net. "Access to cassava mosaic disease-resistant varieties will lead to more yield and incomes in the pocket of farmers."

Solomon Otu, a plant breeder at the University of Ghana-based West Africa Center for Crop Improvement, says that the findings of the research could help strengthen the global cassava starch market and boost food security for millions of people.

Provided by SciDev.Net