

# Managing cassava virus diseases in Kenya

## Introduction

In Kenya, cassava is majorly grown in the Coast, Western and Nyanza regions. Few crop stands are found in Central Eastern and Rift Valley regions.

A major attribute of cassava is its ability to grow in regions where cereals and other crops fail due to drought and low nutrients supply. Lack of a formal seed system for these crop forces growers to exchange uncertified cuttings thereby continually perpetuating diseases infecting the crop.

## Virus diseases of cassava

Cassava mosaic disease (CMD) and cassava brown streak disease (CBSD) are considered the most important due to their widespread nature and notable yield losses. For instance cassava mosaic disease causes yield losses of more than 70% whereas cassava brown streak disease (CBSD) causes up to 100% yield losses. The viruses are both spread by use of infected cuttings or are transmitted by white flies (*Bemisia tabaci*).

Cassava plants infected with CMD express a range of symptoms which depend on the virus species or strain, prevailing environmental conditions, and the sensitivity of the cassava host. Symptoms majorly include mosaic and leaf chlorosis



Cassava plants infected with Cassava mosaic disease

Cassava brown streak disease on the other hand is caused by two different species of CBSD, namely Uganda Cassava Brown streak Virus (UCBSV) and Cassava brown streak virus (CBSV). The brown necrotic streaks that occur on the green portions of stems of CBSD-susceptible varieties gives the disease its name. The most common and distinctive symptoms are however chlorotic mottles on the leaves and development of dry, brown, corky necrotic lesions on the roots. Lesions on roots make them largely inedible and unmarketable



Mosaic symptoms on leaves of a CBSD-infected plant



Root necrosis due to CBSD

## Mitigating the problem of cassava viruses

Stakeholders in agricultural research have been carrying out research on ways of managing the cassava infecting viruses. One of the surest ways is the use of clean planting materials. Recently, Jomo Kenyatta University of Agriculture and Technology (JKUAT) through the Department of Horticulture acquired a grant to fund a project dubbed “Diagnostics for Sustainable Cassava Productivity in Africa project: Kenya chapter” that has established a modern molecular biology laboratory and green house to increase capacity in cassava research and training at the University. The regional project is being implemented in Tanzania, Uganda, Malawi, Mozambique and Zambia. The research team in Kenya led by Prof. Elijah Ateka aims to accomplish a number of activities in the next 3 years.

## Project objectives and activities

Key activities in this project include virus disease surveillance which involves country surveys to determine the distribution of the viruses and their insect vectors. Another key activity of the project is to analyze collected cassava samples for the presence of emerging viruses. Since improved cassava comes from breeders, it is important to work with them. In this regard, the project collaborates with cassava breeders in order to assist them in identifying resistant varieties in the fields. To further interact with farmers at farm level, we intend to carry out training of farmers on how to recognize symptoms and manage the diseases. This will be achieved by setting up demonstration fields at the Coast, Western and Nyanza regions. At these demonstration sites, farmers will be led to appreciate the significance of using virus-tested planting materials.



Team members in a cassava in Nyanza region

In addition to developing diagnostic tools for the emerging viruses, the project also aims at developing human resource capacity through the training of students at MSc and PhD levels

Control measures for CMD and CBSD

1. Use of virus-tested cassava cuttings
2. Use of resistant varieties
3. Control of virus vectors
4. Minimizing germplasm exchange

### Expected outputs

- Rapid and accurate detection and diagnosis tools for CMD and CBSVs infections in cassava developed.
- Control or preventive measures such as use of disease-free planting material and development of resistant varieties promoted
- Distribution of viruses and their vectors in the country determined
- Virus and vector diversity well understood.
- Physical and human resource capacity in the country built

- Farmers empowered to recognize virus disease symptoms and selection of symptom-free planting materials
- Partnerships with stakeholders in cassava research and regulators enhance

### Cassava value added products



### For more information contact:

Prof. Elijah M. Ateka  
 Department of Horticulture  
 Jomo Kenyatta University  
 of  
 Agriculture and Technology  
 P O Box 62000 (0200). Nairobi.  
 Email. [ateka@agr.jkuat.ac.ke](mailto:ateka@agr.jkuat.ac.ke)

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## JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY

### Disease Diagnostics for Sustainable Cassava Productivity in Africa project



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