

Disease Diagnostics for Sustainable Cassava Productivity in Africa project



Use of clean planting material Distribution of clean planting materials to farmers



CBSD



CMD



Bemisia tabaci

JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY



Managing cassava virus diseases in Kenya

Introduction

In Kenya, cassava is majorly grown in the Coast, Western and Nyanza regions. Few crop stands are however 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 nutrient supply. Lack of a formal seed system for these crop forces growers to exchange uncertified cuttings thereby continually perpetuating virus 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 prominent yield losses. For instance, cassava mosaic disease causes yield losses of more than 70% whereas cassava brown streak disease (CBSD) causes up to 100% losses. The viruses are spread by use of infected cuttings or are transmitted by whiteflies (*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 variety. Symptoms majorly include mosaic and leaf chlorosis.



CMD- infected cassava



Team surveying a cassava field in Nyanza

Cassava brown streak disease on the other hand is caused by two different species of viruses, 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 give 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



Cassava roots from a plant infected with CBSD

Mitigating the problem of cassava 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 “**Disease Diagnostics for Sustainable Cassava Productivity in Africa**” 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 seven countries namely Kenya, Tanzania, Uganda, Malawi, Mozambique, Rwanda and Zambia. The research team in Kenya 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 countrywide surveys to determine the distribution of the viruses and their insect vectors. Another key objective of the project is to analyze collected cassava samples for the presence of known and 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, the project team carries out training of farmers on how to recognize disease symptoms and how to manage the diseases. This has been achieved by setting up demonstration fields at the Coast, Western and Nyanza regions. At these demonstration sites, farmers have appreciated the significance of using virus-tested planting materials. In addition to developing diagnostic tools for the emerging viruses, the project is developing human resource capacity through the training of students at MSc and PhD levels.



JKUAT team interacts with farmers during the 2015, Nairobi Trade Fair



Team members in a cassava field in Nyanza

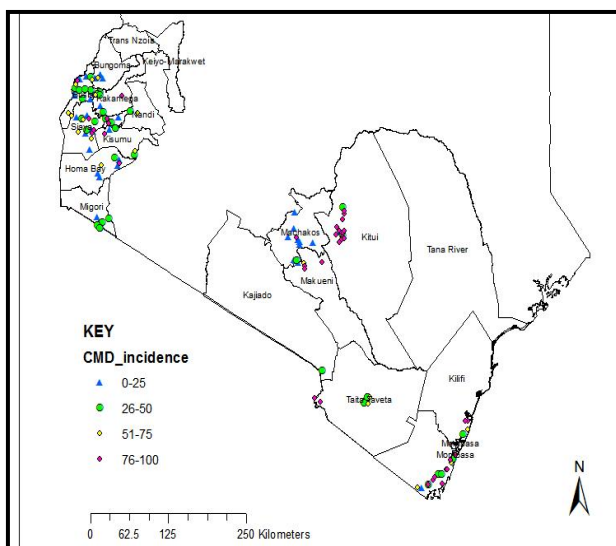
Farmers planting demonstration plots in Bungoma

Control measures for CMD and CBSV

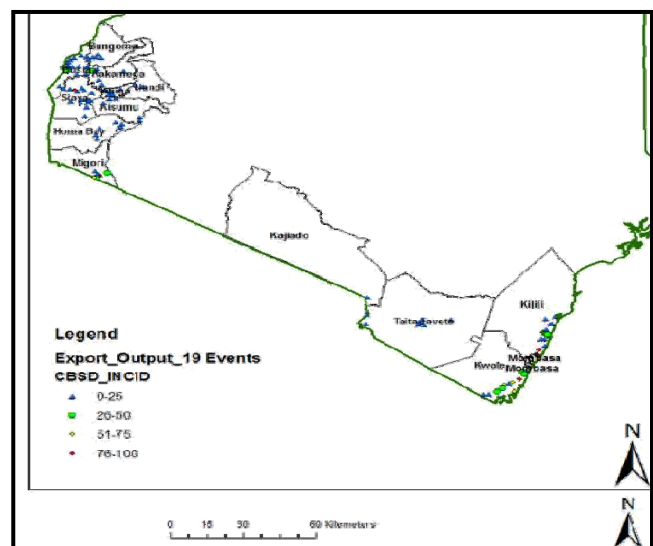
1. Use of virus-tested cassava cuttings
2. Use of resistant varieties
3. Control of virus vectors

Expected outputs of the Project

- 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 determined
- 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 enhanced



CMD incidence in the 2015 survey



CBSV incidence in the 2015 survey



Training of Crop Officers at Busia



Farmers being trained during a field day at Kilifi



Farmers with good harvest from varieties grown using clean planting material

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. eateka@agr.jkuat.ac.ke



This project is being implemented jointly by JKUAT and Mikocheni Agricultural Research Institute, Tanzania.