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**Backgrounder: Cassava mosaic virus disease**

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***Why is this subject important to listeners?***

Cassava mosaic virus disease (CMVD) is the most severe and widespread plant disease in sub-Saharan Africa. CMVD-affected cassava plants produce few or no tubers, depending on the severity of the disease and the age of the plant at the time of infection. CMVD causes significant yield loss (up to 90% in severe cases). It is therefore essential for farmers to be aware of the disease, the insect that vectors\* the disease, how it spreads, and management practices to avoid losses from the disease.

***What are some key facts?***

* CMVD occurs in all cassava-growing areas of Africa, including Malawi. There is general agreement that CMVD is the most important disease of cassava.
* Cassava varieties differ greatly in their response to CMVD.
* CMVD-resistant varieties experience much less severe symptoms than susceptible varieties, especially during the late stages of growth.
* CMVD is largely transmitted through infected stem cuttings; cassava is grown from vegetative cuttings. It is also spread when feeding whiteflies (*Bemisia tabacci*) pass the virus from diseased to clean, disease-free plants.

***What are the big challenges of managing cassava mosaic virus disease?***

* Cassava is grown from vegetative cuttings, and CMVD can be carried from one crop cycle to the next through infected cuttings which are used as planting material. Thus, infection can build up from one crop cycle to the next, particularly when infection is significantly spread by whiteflies.
* Managing CMVD by managing whitefly populations has been a challenge because whiteflies are found in every location, regardless of whether cassava is grown there or not. This makes control of whiteflies difficult and expensive.
* Rouging\* CMVD-infected plants is one way to manage the disease, but farmers are usually unwilling to rogue out infected plants, thus increasing the risk of infection.
* At harvest, farmers should select disease-free stems for selling, exchanging planting materials with other farmers, or replanting. Unfortunately, many farmers ignore this advice, hence spreading the disease.

***Is there misinformation about this subject that I should cover?***

* It is believed that cassava leaves affected by CMVD taste better than leaves from non-diseased plants. As a result, farmers often keep infected plants.

***Predicted impact of climate change on cassava mosaic virus disease***

* Rising temperatures as a result of climate change will create a more favourable environment for whiteflies to breed, which will spread CMVD.
* Changes in weather patterns will affect production of other staple crops, for example, maize. As a result, drought-tolerant crops such as cassava will be highly promoted for food security. This will result in increased sharing of planting materials which are affected by CMVD. This will result in wider spread of the disease among farmers.

***Key information about cassava mosaic virus disease***

**Symptoms**

Symptoms of cassava mosaic disease include leaf chlorosis\*, which is displayed in yellow or nearly white leaves with only a tinge of green, distorted leaves, reduction in leaflet size, and general stunting of the plant.

**Spread**

CMVD is transmitted in two ways: through planting infected stem cuttings, and by whiteflies. Whiteflies spread the disease from infected cuttings to neighbouring healthy plants in newly planted fields.

**Monitoring**

Farmers can determine the seriousness of the disease and how much it has spread by visually inspecting their cassava crop. But symptoms of CMVD can be difficult to detect, especially in dry conditions when crop growth is limited, or when plants develop symptoms of mineral deficiency, or are severely attacked by cassava green mite or cassava mealybug. In these cases, farmers should consult extension workers or plant doctors for advice.

**Impact on yield and income**

CMVD is arguably the most important viral disease of any African food crop. Overall, yield loss across sub-Saharan Africa is estimated at between 15 and 24% of the cassava crop annually, which is equivalent to 12-23 million tonnes, or an annual loss of $1.2-2.3 billion US. Yield losses in individual varieties reportedly range from 20 to 95%. Losses depend on the variety and the stage of infection, but are usually substantial.

**Management**

There are two main approaches to managing CMVD: using resistant varieties and sanitation measures.

Using resistant or tolerant varieties has obvious advantages in seeking to decrease losses, and African breeding programs have long worked at developing these varieties. The basic approach is to select cuttings for planting from symptom-free mother plants. Selecting symptom-free planting materials is easy and can be very effective if the parent plants are growing vigorously and not expressing disease symptoms.

When the spread of CMVD is not rapid, farmers can also control the disease by removing diseased plants (rouging) shortly after sprouting.

***Where can I find other resources on this topic?***

1. CABI. *Cassava mosaic disease (African cassava mosaic disease)*. Invasive Species Compendium. [www.cabi.org/isc/datasheet/2747](http://www.cabi.org/isc/datasheet/2747)
2. CABI. *Cassava mosaic disease.*<http://www.invasive-species.org/invasive-species/cassava-mosaic-disease/>
3. Integrated Cassava Project. Publications on cassava at: <http://cassavabiz.org/>
4. UN Food and Agriculture Organization, 2007. *Combating cassava mosaic*. [www.fao.org/newsroom/en/field/2007/1000693/index.html](http://www.fao.org/newsroom/en/field/2007/1000693/index.html)
5. Wikipedia. *Cassava mosaic virus*. <https://en.wikipedia.org/wiki/Cassava_mosaic_virus>

***Key definitions***

**Chlorosis:** Abnormal reduction in or loss of normal green colouration in plant leaves.

**Rouging**: Removing poorly performing or diseased plants in the field

**Vector:** An organism that does not cause disease by itself, but spreads the infection by conveying the disease organism from one host to another

## Acknowledgements

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