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Controlling cassava brown streak disease and blocking a pandemics by pre-emptive action – experiences from the field

SAMAR SHEAT¹, PASCAL MITAMBO², STEPHAN WINTER¹

¹*Leibniz Institute DSMZ - German Collection of Microorganisms and Cell Cultures, Plant Virus Department, Germany*

²*Action des Volontaires pour la Paix et le Developpement (AVPD), The Democratic Republic of the Congo*

Abstract

Cassava brown streak disease (CBSD), a devastating virus disease of cassava in East Africa with pandemic proportions and severe impact. The viruses are spreading south- and westwards, to Zambia and DR Congo presenting a serious threat to cassava cultivation on the continent. We are studying the brown streak viruses to characterise the disease, identify resilient cassava varieties and to find loopholes in the biology of the viruses to disrupt the disease cycle, prevent further spread and devise solutions for crop management.

In contrast to cassava mosaic virus disease (CMD), there is no African varieties resistant to the viruses instead, there are varieties that become infected however a broader destruction of the roots from necrosis only becomes evident in following years, when cuttings from infected plants are taken for propagation. Planting of a healthy crop is key to management of the disease, however, pending a “formal” seed system for cassava, in epidemic zones, there are no sources of healthy planting materials and because of a shortage of planting material and neighbourhood exchange, human assisted spread is a main driver of the pandemics. From our fundamental research on the viruses, we concluded that, in contrast to CMD, virus spread by viruliferous whiteflies occurs but is not a main pathway of CBSD spread. Based on our findings, we concluded that there are ample options to manage this disease and decided to devise an intervention strategy to control CBSD aiming at eradication of the virus disease from the cassava fields.

We report the results of our work in South Kivu, Dr Congo, namely on the Plains de la Ruzizi an epicentre of CBSD where substantial cassava cultivation, in a main production zone of the crop, was disrupted by the disease. In 2017, we created an introduction farm (nursery) to receive materials from the laboratory in Germany, installed a cassava production and demonstration site and started to produce cassava keeping strict phytosanitary measures and monitoring. In March 2022 we harvested a highly performant crop from 1.5 ha, to provide virus-free cuttings to farmer’s associations and NGO’s in South and North Kivu.

Keywords: Cassava, CBSD, CMD, disease management, phytosanitary measures, virus-free cuttings