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“Management of land use systems for enhanced food security:  
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## Controlling Emerging Virus Diseases of Food Staples in Sub-Saharan Africa

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### Abstract

In the past two decades, emergence of new- and reemergence of established viruses have posed serious threat to crop production and also to agricultural research and development and trade due to restrictions on movement of germplasm and crop products. The most notable virus epidemics in 21<sup>st</sup> century are caused by Maize chlorotic mottle virus (MCMV) and Cassava brown streak viruses (CBSVs) in East Africa. Introduction of MCMV, previously not known to occur in Africa, contributed to maize lethal necrosis epidemic; whereas CBSVs were known to be endemic in the coastal plains in southern and eastern Africa. They have gained importance around the Great Lakes region since 2000s. Several other viruses occurring in Africa have different status based on the presence or absence in a given country. For instance, Banana bunchy top virus (BBTV) is endemic in Central Africa, and is an emerging threat to banana and plantain production in West and Southern Africa. In countries where it is absent BBTV is a List-A quarantine pathogen. Agricultural intensification, changing farming practices, weak monitoring capacity and increasing inter-continental trade appear to be the key drivers for the emergence and spread of new and known virus diseases. The Plant Health Research group at IITA is focused on countering the viral threats to important food staples such as cassava, maize, yam, cowpea, banana/plantain and soybean. Development of host resistance, deployment of virus-free planting material and enforcing phytosanitation and containment strategies have been the major tactics adopted for virus disease control. This applied work is underpinned on the knowledge and technologies generated by characterisation of viruses, understanding virus diversity, virus-host-vector interactions, disease epidemiology, development of diagnostic tools, and production of virus-free planting material and development of resistant varieties both by conventional and transgenic approaches. IITA is emphasising on an ‘alliance’ approach by bringing together national and international organisations to tackle virus disease epidemics. ‘Alliance against BBTV in Africa’, is one of the models being used for recovering banana production in BBTV-affected areas and arrest further spread of the virus. Early success indicates that a unified agenda and collective approach is critical to the successful control of trans-boundary virus diseases in sub-Saharan Africa.

**Keywords:** Banana bunchy top virus, Cassava brown streak viruses, maize chlorotic mottle virus, maize lethal necrosis virus, virus free planting materials