

Maize lethal necrosis – potential threat to local maize production

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Maize is the most important cereal crop in South Africa and is planted in seven of the nine provinces (including the Free State, Mpumalanga, North West, Gauteng, KwaZulu-Natal, Limpopo and the Northern Cape), covering 2,78 million ha. Maize production is primarily rain dependant in the country as 60% of the crop is cultivated on dry land, while only 20% is irrigated.

A serious disease outbreak of maize lethal necrosis (MLN) was first reported in September 2011 in Kenya with crop losses of up to 100%. By 2012, MLN symptoms were observed to have spread to other districts. Since then, the disease has been reported from Rwanda and the Democratic Republic of the Congo to Uganda, Tanzania, South Sudan and Ethiopia.

MLN is a potential threat to food security in southern Africa and potential avenues of reaching South Africa would be from Tanzania into Mozambique and into the sub-tropical areas of South Africa where subsistence maize is often grown throughout the year.

Viruses involved in MLN

MLN disease symptoms (*Figure 1*) are generally caused by the synergistic co-infection of maize with maize chlorotic mottle virus symptoms (MCMV) (*Figure 2*) and any virus from the family Potyviridae. These include wheat streak mosaic virus (WSMV), maize dwarf mosaic virus (MDMV) or sugar cane mosaic virus (SCMV, formerly MDMV-B) symptoms (*Figure 3*). Singular infections of each virus produces milder plant symptoms, but when combined, produce a synergistic reaction that often result in plant death. In many cases, MCMV infections with abiotic stress conditions, such as drought or low nitrogen, have also been known to develop typical MLN symptoms.

MCMV has not yet been reported in South Africa. However, MDMV infects maize plantings on a very small localised scale, but can be very severe in these areas. Locally, SCMV has been reported to occur on sugar cane and is widespread throughout the sugar cane industry. Sugar cane is often grown in close proximity to maize fields, both commercially and by subsistence farmers. It is possible that maize grown in these areas may become infected with SCMV.

Presently, a survey on maize viruses is being conducted by the ARC-Grain Crops Institute and the University of Pretoria throughout the South African maize industry to determine what viruses do occur. MDMV and maize streak virus (MSV) have been reported, and the results of the survey will allow an objective assessment as to the potential risk of MLN becoming an epidemic.

Host plants

The experimental host range where MLN disease is concerned, is restricted to the grass (Poaceae) family with maize being the primary and natural host. A number



Figure 2: Maize chlorotic mottle virus (MCMV) symptoms on maize

