

Maize Lethal Necrosis Disease (MLND)

Background

Maize is an important strategic crop which is grown by millions of farmers in the SADC region as both a food crop and a cash crop. This staple food of most countries in the SADC region is threatened by the occurrence of the Maize Lethal Necrosis Disease (MLND) which has been reported in East Africa. The disease was first reported in Kenya, (South Rift Valley - Bomet and Naivasha districts) in September 2011, although its extent at that point suggested that the disease had been present for some time. MLND has also spread rapidly into Tanzania, Uganda and South Sudan (FAO, 2013).

Recent reports indicate high possibilities of this disease spreading to the Southern African countries which if not contained could result in devastation and food insecurity to the SADC region from possible crop failure and reduced yields given the role of maize as the main staple crop for many countries in the region. Maintaining vigilance and taking proactive action by all key stakeholders is necessary to manage this threat.

Symptoms of MLND

MLND occurs when maize is simultaneously infected by the Maize chlorotic mottle virus (MCMoV) and Sugarcane mosaic virus (SCMV) or sometimes another cereal virus of the Potyviridae group. The maize chlorotic mottle virus (MCMV) causes a variety of symptoms in maize depending upon genotype, age of infection and environmental conditions. The symptoms include: i) excessive tillering, ii) severe stunting resulting in premature plant death, iii) shortened male inflorescences, iv) severe leaf mottling, v) dry leaves, v) a rotting cob which develops very few grains as it matures.



How the Disease Spreads

This disease can be spread from plant to plant and field to field by common vectors such as maize thrips, rootworms, leaf beetles, seeds, maize residues (leaves), farming implements and animals. The disease appears to have high occurrence in places where maize is grown continuously.

Disease Control

MLND has no cure but the disease can be controlled through employing integrated pest management approaches. Scouting of the field should be done and once the diseased plants are found, those plants need to be up-rooted, buried deep or burnt in an isolated part of the farm. Crop rotation needs to be

practised to break the cycle of the disease and the affected area should not be planted with maize for 3-4 seasons. The use of treated certified seed is encouraged to control the vectors coupled with foliar sprays just before or when the plant reaches knee height to control the population of vectors. The use of resistant varieties offers a long term solution. Keeping the field free of weeds helps to minimise host plants for vectors. Application of manure and other fertilisers boosts the plants vigour and defence against the disease.

Possible Social Impacts of MLND

The impact of the disease affects the whole maize value chain. According to the Kenyan Ministry of Agriculture, two percent of the maize harvest was affected in 2012. In 2015, the losses were estimated at 10% (East African Business Week, 2015). From experiences in Kenya, it was reported that MLND could cut Kenya's maize production by as much as 30% (Burite, 2014).

Reduced maize yields from the impact of MLND would affect people's livelihoods as a result of reduced incomes leading to increased financial stress on families due to inability to afford basics such as education for their children. Maize is planted by a large number of farmers so the increased use of pesticides to control the vectors in the production of maize may also have a negative impact on the environment and adds to additional costs in production of maize seed.

CCARDESA Interventions

CCARDESA, working with other stakeholders have mounted on-going surveillance and monitoring of MLND spread in border areas of countries neighbouring Tanzania, in particular, Malawi, Mozambique and Zambia. Stakeholder sensitisation workshops have been convened on disease identification and vector management as well as strengthening implementation of phytosanitary measures to minimise the spread of MLND. Breeding of disease resistant or tolerant varieties that will be tested and released in line with the SADC Seed Harmonisation Policy framework has also been embarked upon.

CCARDESA and the regional economic communities (SADC and COMESA Secretariats) are also collaborating on priority Sanitary and Phyto-Sanitary (SPS) threats including MLND. Mechanisms of how best to strengthen the phytosanitary regulatory environment and other capacities to curb the further spread of the disease are being explored. There is need to develop a comprehensive regional response and build capacities of phytosanitary agencies, giving the commercial seed sector, particularly small-to-medium size companies, access to MLND diagnosis, improved seed varieties to enable them to produce clean seed for farmers. Promotion of good agricultural practices is critical towards stemming this threat from moving down south.

Bibliography

- CCARDESA - APPSA annual report, 2015: Development of maize varieties resistant to major diseases in Mozambique, Malawi and Zambia.
- Bradley Flett and Kingstone Mashingaidze, 2016: Maize Lethal Necrosis - Possible threat to local maize production. ARC-LNR Grain Crop Institute, Potchefstroom, South Africa.
- CABI, 2012: Invasive Species Compendium. (<http://www.cabi.org/isc/datasheet/119663>)
- FAO, 2013: Maize Lethal Necrosis Disease, A snap short. (www.fao.org/emergencies/resources/documents/resources-detail/en/c/179179/)
- George Mahuku, *et al*, 2015: Maize Lethal Necrosis (MLN), an Emerging Threat to Maize-Based Food Security in Sub-Saharan Africa. APS Journal, Volume 105, Number 7, Pages 956-965.
- Kenya Seed Company Limited (undated), Maize Lethal Necrosis Disease (MLND), <http://www.kenyaseed.com/files/MLND.pdf>