

AFSTA Position Paper on Maize Lethal Necrosis Disease (MLND)

(Adopted electronically by AFSTA members on 31st May 2016)

AFSTA recognizes that maize is one of the most important food crops in Africa, providing income and livelihood to most of the communities in the continent. However, maize production in Eastern Africa is currently facing devastating effects due to the outbreak of Maize Lethal Necrosis Disease (MLND) maize disease. This disease was first reported in Kenya in late 2011, and within 2 years was reported in Uganda, Tanzania, Rwanda, South Sudan, D.R. Congo, Ethiopia and in the late planting in Egypt. Since the first incidence in Kenya, and later in other parts of Eastern Africa, maize production has been seriously affected and the disease caused losses to maize seed companies and negative impacts to the livelihood of communities in the affected areas. AFSTA is concerned about the intensity and quick spread of MLND in Eastern Africa and hopes for a quick solution and counteract to its negative effects.

MLND is a viral disease caused by combined infection of maize plants with Maize chlorotic mottle virus (MCMV) and the sugar cane mosaic virus (SCMV) or one of the other maize potyviruses. Each virus can cause production issues, but the MLN complex is more damaging than either virus alone. The effect of the complex is more than additive; there is a synergy between the two viruses that results in crop damage.

MLND-infected maize plants show chlorotic mottling on the leaves, usually starting from the base of the young leaves and extending upward towards the leaf tips. Advanced stages of MLND disease are reflected by necrosis of the leaf margins and progressing to the midrib, stunting of the plant, and eventual necrosis (drying-up) of the leaves and whole plant. Plants that are affected at the later stages of the growth show chlorotic mottling on the leaves and dry leaves starting from the top, and either show barrenness (with no ear formation) or poor seed set. Fungal infections were also often observed on the MLND affected plants, and severely affected plants often result in diseased ears and poor quality grains that are unfit for consumption.

AFSTA recognizes that to minimize impact of MLN on seed or grain production (yield), the following best management practices are recommended:

- **Resistance:** Frequent scouting of fields for viral symptoms allows for quicker response to an emerging outbreak and eradication of any plants with any symptoms of MLN. Remove infected plants from the field and destroy the infected tissues. If the plants are not removed from the field, the virus can leach into the soil and increase chances of soil transmission to a new planting.
- **Monitor/Control Insect Vector Populations:** Insecticide seed treatments can provide some protection to seedlings through V5 stage. Foliar insecticide applications should begin at V4+ if vector populations are present. Control thrips, plant hoppers and aphids.

- **Host Reservoirs:** Eliminate grasses and all viral host reservoirs including volunteer corn in and around the corn field. Grasses and other weeds can serve as viral reservoir hosts and provide refuge to insect vectors. Eradication of weeds in and around plots can help minimize the risk of viral introduction. Perennial grasses can retain virus in their rhizomes and allow a viral pathogen to persist in a field location through fallow or crop cycling.
- **Crop Rotation:** Avoid planting into fields previously planted to corn or other grasses such as sorghum or millet unless it is confirmed that virus symptoms were not observed in these fields.
- **Fallow:** Fields that exhibited symptoms of MLN should be fallowed for several months before replanting with corn or millet. Replanting into previously infected fields can result in soil transmission to the new corn or millet crop. Infected fields should be fallowed or planted with non-host species (non-graminaceous crops).
- **Clean Seed:** Do not replant seed from fields that have experienced MLN. Use clean certified seed from your local seed dealer. Certified seed has been tested to assure it does not contain virus. Even certified seed may emerge with some viral symptoms if planted into previously infected field soil. In these cases the infection is from soil transmission and not from contaminated seed.

AFSTA is willing to work with all private and public stakeholders and development partners to ensure that the seed industry minimizes the spread of MLND in the continent and beyond.