

ABSTRACT

Maize (*Zea mays*) is a staple crop central to food security and livelihoods across sub-Saharan Africa. In recent years, maize production in the region has been severely affected by maize lethal necrosis disease (MLND). First reported in Kenya in 2011, MLND has spread rapidly across eastern and central Africa, leading to significant yield reductions and serious socioeconomic impacts on smallholder farmers. The study examined early symptom development of MLND and evaluated the effects of foliar boron and exogenous RNase A on the growth of maize plants inoculated with MLND-infected sap. Two completely randomised trials were conducted 1 week after inoculation to assess maize growth responses to varying foliar boron concentrations and exogenous RNase A over 14 days. Stem inoculation induced a progressive sequence of foliar symptoms 2 days postinoculation, from discrete lesions and faint chlorotic streaks to extensive mosaic yellowing and tissue collapse. Advanced infection caused apical meristem death in 28.9% of the inoculated plants, triggering compensatory lateral shoot growth. Foliar application of exogenous RNase A resulted in statistically similar ($p > 0.05$) growth traits when compared to the inoculated plants with no treatments. However, foliar application of boron at a concentration of 15 mg L^{-1} resulted in significantly higher ($p < 0.05$) aboveground biomass yield when compared to the inoculated plants with no treatments. Molecular and serological analyses show that boron application at 15 mg L^{-1} effectively suppressed viral accumulation to below detectable levels. These findings provide a basis for developing low-cost strategies to manage the disease.