

# Effectiveness of macro propagation technique in production of healthy banana seedlings in Eastern and Central regions, Kenya

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Banana (*Musa* spp.) is one of the most important food and cash crops in Kenya. It provides food security, nutrition and income for many smallholder farmers. Bananas are eaten ripe or cooked depending on the variety. Despite its economic importance banana production faces major challenges including scarcity of high quality seedlings, insect pests and diseases. Demand for pest free and high quality planting materials has been on the increase. Naturally regenerated suckers that are preferred by farmers are more likely to carry pests and diseases leading to reduced productivity and a short lifetime of new plantations. Tissue Culture has been introduced but its adoption has been low due to the high costs and skills involved. To address this constraint macropropagation has been introduced as an alternative propagation technology. The technology can be implemented with little capital and skill. The study was aimed at assessing whether macropropagation technology can produce healthy banana seedlings. A survey was conducted to identify the current important diseases and insect pests of bananas in Eastern and Central Kenya. Macropropagation nurseries were established at Kenyatta University and in farmers' fields at Mathioya, Kirinyaga, Embu East, Meru Central and Mitunguu and Ntharene in Imenti South District. These sites represent different agroecological zones, including high, mid and low altitudes. Corms obtained in accordance with established quality assurance protocols were propagated and the health of the macropropagated banana seedlings monitored. Macropropagation was done in two cycles, the first in Feb - June 2011, and the second from July - November 2011. The importance of the isolated organisms in banana health was determined through pathogenicity tests carried out under controlled conditions. To determine the effectiveness of macropropagation protocol in eliminating pathogens, corms were artificially inoculated with *Radopholus similis*, *Fusarium oxysporum* f. sp. *eubense* (Foe) and *Xanthomonas vasieola* pv. *musaeearum* (Xvm) followed by monitoring health of the seedlings from the inoculated corms. *Fusarium* wilt and Sigatoka were recorded as the most important diseases with 66 and 50% incidence respectively, while nematodes and banana weevil were the most important pests with 21 and 17% incidence, respectively. An average of 98 and 100% healthy seedlings resulted from the first and second cycles of macropropagation. Under simulated infection, macropropagation did not eliminate Foe and Xvm but completely removed plant parasitic nematodes (PPN). The study found that macropropagation technique is an effective method to produce healthy banana seedlings however precaution is needed to ensure quality of the seedlings where Xvm and Foe are present. The key control points for safeguarding health and quality of the macropropagated seedlings is during certification of corm sources to ensure selection of healthy corms the process should be done aseptically and the corms should be treated before planting.