

Efficiency of Macropropagation in Relation to Other Banana Seedling Production Methods in Different Agro-ecologies in Central and Eastern Kenya

Author: Kasyoka, Martha Rhoda

Abstract:

Bananas and plantains (*Musa* spp.) are amongst the most important tropical fruit crops and are staple foods in most parts of the humid tropics and important sources of income to small scale holders in rural areas. In Kenya, banana is grown as an important food and cash crop. However, its cultivation has largely remained small scale. A common limiting factor to large scale production and expansion of existing plantations is the difficulty in obtaining high quality planting materials. Natural regeneration relied on by most farmers is slow and could be a source of pests and diseases in new plantations. In addition, the numbers of seedlings generated are inadequate. Although tissue culture (TC) can produce a large quantity of high quality planting materials, it is not a viable option to small scale farmers due to the high cost of seedlings. To increase banana production, there is need for an easy-to-implement and affordable method of producing seedlings among small scale holders. This study investigated macro-propagation as an alternative low cost method for producing banana seedlings. In the present research, farmers showed preference for certain banana cultivars in five agro ecological zones namely LH1, UM1, UM3, UM4 and LM3. Cavendish, Gros Mitchel, Uganda green and Sweet banana were identified as the most popular varieties with percentage preferences of 70, 60, 15 and 15% respectively. Macropropagation nurseries were established in the five agro ecological zones. Efficiency of macropropagation as affected by genotype and ecology was then determined. Seedling production through macropropagation was also compared to micro-propagation and natural regeneration over a period of six months. Evaluations were done on the number of seedlings produced, costs of production and requisite skills. Growth characteristics such as height, number of leaves and diameter of the suckers from each technique were evaluated and compared under field conditions. Data was analyzed to form the basis for recommending the best cultivars in relation to the macropropagation technique and agro-ecological zones. Macropropagated seedlings were not significantly different from TC seedlings in terms of growth four months after transplanting ($p>0.05$). Seedlings produced through TC and MP reached average heights of 66.6 ± 2.58 cm and 62.56 ± 1.99 cm; and average diameters of 7.90 ± 0.37 cm and 7.43 ± 0.21 cm respectively four months after planting. However, macropropagation was significantly different ($p>0.05$) from TC and natural regeneration. It required less skills and capital investment compared to TC; Seedling production through macropropagation was easy and required a lower level of education compared to TC hence can be easily adopted among small scale farmers albeit with proper training. This can greatly increase banana production which will uplift the livelihoods of many Kenyans who depend on the crop.