

Research Application Summary

**Preferred banana varieties and their seed systems in Eastern and Central provinces of Kenya**

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**Abstract**

Banana is an important crop for food security in Kenya. Its production has been hindered by scarcity of seedlings and pests, among other factors. A recent survey in eastern and central Kenya showed that desert varieties are preferred due to market demand. Natural regeneration is also preferred by most farmers (>85%) but it is inefficient and a source of pests and diseases to new plantations. On the other hand, adoption of tissue culture has been hindered by high cost of seedlings. Farmers need to be educated on shortcomings of natural regeneration and affordable seedling delivery system implemented. Macropropagation supported by an efficient delivery system is proposed to boost banana production in Kenya.

Key words: Bananas, Kenya, macropropagation, seedling, varieties

**Résumé**

La banane est une culture importante pour la sécurité alimentaire au Kenya. Sa production a été entravée par la pénurie de pépinières et animaux nuisibles, entre autres facteurs. Une enquête récente dans la partie orientale et centrale du Kenya a montré que les variétés du désert sont préférées en raison de la demande du marché. La régénération naturelle est également privilégiée par la plupart des agriculteurs (> 85%), mais elle est inefficace et une source de parasites et les maladies affectent les nouvelles plantes. D'autre part, l'adoption de la culture de tissus a été entravée par le coût élevé des pépinières. Les agriculteurs ont besoin d'être éduqués sur les lacunes de système de régénération naturelle et abordable de prestation des semis mis en œuvre. La macro propagation pris en charge par un système de prestation efficace est proposée pour stimuler la production de bananes au Kenya.

Mots clés: Banane, le Kenya, macro-propagation, des semis, des variétés

## Background

Access to adequate nutritious food has been an increasing concern in Kenya. Food security is worsened by reliance on a narrow range of crops that are highly vulnerable to changing climate, especially drought, declining soil fertility, and high incidence of pests and diseases. Introducing bananas has been proposed as a suitable alternative to diversify the food resource base in Kenya. Bananas grow in diverse agroecologies and produce all year round. However, banana cultivation is largely hindered by scarcity of high quality planting materials. Farmers rely on natural regeneration of existing stools which often does not supply adequate healthy suckers of the preferred varieties. Naturally regenerated suckers also have higher risk of pests and pathogen spread. To improve access to planting materials it was necessary to obtain information on farmers preferred cultivars and the prevailing seed systems.

## Literature Summary

The demand for high quality banana seedlings is very high in most banana growing areas. Across Africa, expansion of banana cultivation is greatly hindered by scarcity of high quality seedlings (Nkendah and Akyeampong, 2003). Most farmers depend on natural regeneration of existing plants to obtain seedlings, which is a slow process and quite often does not yield adequate amounts (Faturoti *et al.*, 2002). Propagation material derived from the infected mother stocks results in perpetuation of pathogens leading to low yields and poor quality fruits. Although tissue culture (TC) propagation is efficient in terms of quality and quantity, its adoption is constrained by high capital and skills needs leading to high seedling cost (Sahijaram *et al.*, 2003).

Bananas are widely consumed in Kenya with desert type having higher demand especially in urban markets (FAO-UNICTAD, 2009). Cooking bananas are also highly demanded but the supply is limited, and where available they are costly. In most rural areas, the effects of global climate change, e.g. reduced rainfall and prolonged drought have affected food security, especially for households depending on maize. Bananas are viewed as a suitable alternative since they produce year round, and some varieties tolerate water stress better than other commonly grown food crops. To promote banana production in Kenya it is necessary to determine what varieties farmers prefer and the major production constraints.

## Research Approach

A survey was carried out in July 2010 to determine the banana varieties with highest demand in the key banana producing districts of Muranga (North and South), Kirinyaga (East and West), Embu (East and West) and Meru Central and Imneti

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South, in Eastern and Central provinces, Kenya. Information was also recorded on the current sources of planting materials. Plantations with a minimum of 100 stools were sampled randomly at an average spacing of 4 km along major roads. Data were obtained through a questionnaire administered to farmers and observations made during a transect walk through each plantation. Varieties grown were identified based on morphological traits and information from farmers.

Results showed that cultivar preference varied primarily with market demand and, to some extent, with agroecology, local culture and exposure to new technologies through NGOs. In Muranga the predominant variety was Israel (>60%) followed by Kampala; in Meru and Kirinyaga, Kampala variety had higher market demand (>80%). In Embu the preference for the Fusarium resistant variety Grand Nain was more due to influence from NGOs rather than as a response to the high incidence of Fusarium wilt disease in the area. In nearly all areas, traditional and cooking varieties such as Mururu, Mutahato, Nyahobe, Mbiri, Kibunda, Kiganda/Githumo were disappearing, despite their increased demand for them. The predominant preference of dessert varieties (>80%) to cooking cultivars (<20%) was largely due to market demand and this appeared to compromise food security. This seemed to be the case because since the income from banana was usually controlled by men and was likely to be diverted to other non food expenses. This situation could be addressed by ensuring that each household plants several stools of cooking banana varieties, among other food crops.

Most farmers were of the opinion that natural regeneration provided adequate seedlings that resulted in robust growth and establishment after transplanting. However, majority of respondents did not seem to be aware of the plant health risks posed by transplanting naturally regenerated suckers. In addition this practice was viewed as being inadequate to supply planting materials required for commercial scale of production. Although most farmers (>75%) across the survey area were aware of tissue culture technology, adoption was low (<20%) due to high cost of seedlings, intense management required for tissue culture plantations and a perception that tissue culture plants take longer to mature. A general misunderstanding of the tissue culture technology was also determined to exist.

Based on the findings of this survey, it was concluded that the main challenge to improving banana seed systems was to

change farmers altitude regarding adequacy and quality of naturally regenerated suckers. To improve banana productivity, farmers' attitudes should be addressed through creation of awareness on the low quality, especially plant health risks, of naturally regenerated suckers. A strategy is also needed for supplying affordable high quality seedlings, including of traditional varieties. This will be achieved through participatory evaluation and introduction of the low cost banana macropropagation technology in the ongoing phase of this project.

This research determined the banana varieties most preferred by farmers in Central and Eastern Kenya. In addition, the constraints farmers face in obtaining quality seedlings have been documented. This information will be used to guide seed suppliers to be able to meet farmers requirements and to improve seed supply systems, e.g. through introduction of macropropagation technology.

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