

Evaluation of Production and Performance of Different Varieties of Potatoes under Conventional Farming Methods at ADC Sirikwa Kuresoi North

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ABSTRACT

This study evaluates the production and performance of various seed potato varieties under rain-fed agricultural conditions. Conducted at ADC Sirikwa during the short rain season of 2024/2025, the trial focused on six main potato varieties: D/Robjin, Shangi, Unica, K/Karibu, Sherekea, and Nyota. The experiment analyzed production per plant, overall productivity per acre, and the potential revenue impact. Nyota emerged as the highest-yielding variety, while Shangi showed the lowest productivity. The study highlights opportunities for increasing ADC seed potato yields and revenue through improved management practices.

Keywords: potato varieties, rain-fed agriculture, productivity, Nyota, K/Karibu, Unica, Shangi, Sherekea, ADC Sirikwa

INTRODUCTION

Potatoes are a vital food and cash crop worldwide, contributing significantly to food security and economic development (Ministry of Agriculture, 2021). Potato production in Kenya can vary according to the demands of the farmer. Some farmers can aim to produce wares for market consumption or seed (Muthoni et al., 2014). This study aimed to assess the production potential of six seed potato varieties under the prevailing conditions at ADC Sirikwa Kuresoi North. Kuresoi North experiences long rains in March, April, May, and June. (ESIPISU, 2025)The short rains are received in October and November. Soils in Kuresoi North are volcanic and well-drained. Temperatures experienced in Kuresoi North range between 9°C- 27 °C (Nakuru County Spatial Plan, 2019). Potato production faces many different challenges when it comes to production for small-scale farmers. We aim to highlight such factors and help the farmer in the production of high-quality and quantity (Chepkoech, Odiwuor, & Cheron, 2021). The primary objective of the trial was to evaluate the production and performance of various seed potato varieties under rain-fed agricultural conditions. The trial's findings will guide ADC in optimizing potato seed production to meet national demand and enhance profitability.

MATERIALS AND METHODS

The trial took place at ADC Sirikwa during the short rain season of 2024/2025. All potato tubers underwent artificial dormancy breaking using Tivag at 0.5 ml/ltr and were sprouted at ADC Molo cold rooms. Planting was performed using a spacing of 75 cm x 30 cm, with NPK (23:23:0) Yara fertilizer applied at 2.8 bags per acre. The potatoes were planted in a Completely Randomized Block Design (CRBD) with three replicates per variety, each replicate comprising three 3-meter rows. Agronomic practices were performed promptly, and no top dressing was applied. Dehaulming and harvesting were synchronized, allowing late-maturing varieties adequate time for full maturity.

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RESULTS

Average Production per Plant

The average production per plant for the six varieties is summarized below:

Table 1: Average production per plant

Variety	Number of Plants	Total Weight (kg)	Average Production per Plant (kg)
D/Robjin	11	11.80	1.10
Shangi	10	9.25	0.93
Unica	11	16.05	1.45
K/Karibu	12	18.15	1.50
Sherekea	14	14.40	1.03
Nyota	12	24.95	2.10

Observations

Nyota demonstrated the highest average production per plant (2.1 kg), while Shanghi had the lowest (0.93 kg). Environmental and management factors likely influenced these results. Kenya Karibu and Unica are at par with each other, followed closely by Dutch Robjin.

Productivity per Acre

Using an estimated plant population of 17,888 plants per acre, the productivity per acre for each variety is shown below:

Table 2: Productivity per acre

Variety	Average Production per Plant (kg)	Productivity per Acre (kg)	Productivity per Acre (x50kg bags)	Productivity less than 30% By-products (x50kg bags)
D/Robjin	1.10	19,677	394	276
Shangi	0.93	16,636	333	233
Unica	1.45	25,938	519	363
K/Karibu	1.50	26,832	537	376
Sherekea	1.03	18,425	369	258
Nyota	2.10	37,565	751	526

DISCUSSION

The results indicate that Nyota significantly outperforms other varieties in terms of productivity per acre. Despite the corporation's current target of 104 x50kg bags per acre for all varieties, actual farm yields average only 80 x50kg bags per acre. These findings suggest that management practices and environmental factors must be scrutinized to bridge this productivity gap. Improving yields could substantially increase seed potato supply and revenue for ADC.

CONCLUSION

This trial highlights the varying productivity levels among different seed potato varieties under rain-fed conditions at ADC Sirikwa. Nyota showed the highest yield potential, while Shanghi had the lowest. Addressing management challenges and optimizing agronomic practices could enable ADC to significantly enhance productivity and contribute to national seed potato demand. Future research should explore specific factors affecting yield and potential interventions to optimize production.

RECOMMENDATIONS

1. *Focused Cultivation of High-Yielding Varieties*: Prioritize Nyota for large-scale cultivation due to its superior yield performance.
2. *Agronomic Practice Optimization*: Review and refine agronomic practices, including fertilizer application and pest management.
3. *Further Research*: Conduct additional studies to identify and mitigate factors limiting productivity.
4. *Capacity Building*: Train farm staff on best practices for potato seed production.

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