

The Effect of Fertilizer Combinations on Growth, Yield and Economics of Potato Production

Background

Potato is an important crop for Uganda as it contributes to national food security and source of income for smallholder farmers. Nevertheless, potato yields in Uganda remain low. Some of the major factors contributing to lower potato output include poor soil fertility; low adoption of modern agricultural technologies such as chemical fertilizers, fungicides, and insecticides. PNSP aims at improving potato productivity in Uganda by addressing such technical challenges.

A field research was conducted in Elgon region during the first planting season in 2021, specifically, to address soil fertility concerns through application of various fertilizer combinations to boost yield and improve economic benefits for the smallholder farmers.

Objectives

1. To analyze growth and yield response to different NPK fertilizer combinations and micronutrients at varying rates and mode of application
2. To evaluate the economic performance of potato production through adoption of location-specific fertilizer recommendations.

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Methods

Farmer groups trained under PNSP farmer field business schools (FFBSs) offered potato fields as sites for the study.

In March 2021, 12 suitable sites were verified in Mbale, Kapchorwa, and Kween districts.

Soil samples were collected from the sites and analyzed to determine inherent soil fertility and health.



Seven fertilizer blends were applied; these included macronutrients, i.e., nitrogen, phosphorus, and potassium (NPK), at a constant rate of N but varying levels of P and K, and micronutrients, such as boron and zinc.

T1 No fertilizer (Control)

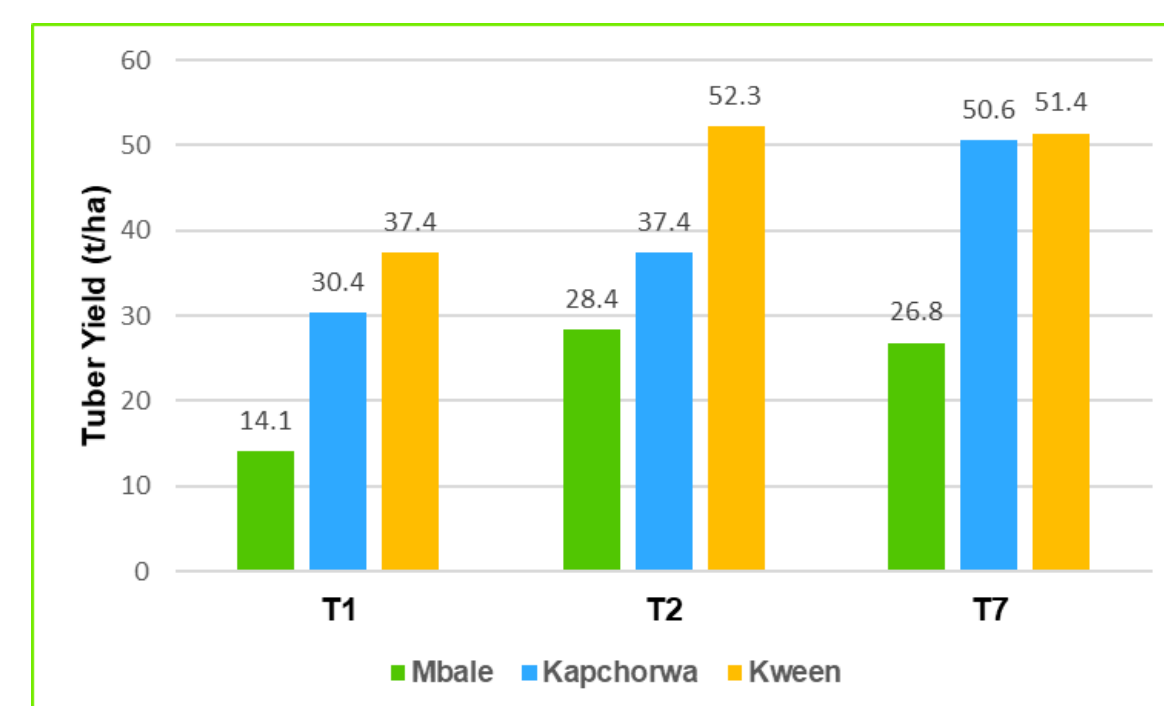
T2 NPK:17:17:17

T7 NPK:17:17:17 + SOP + Urea

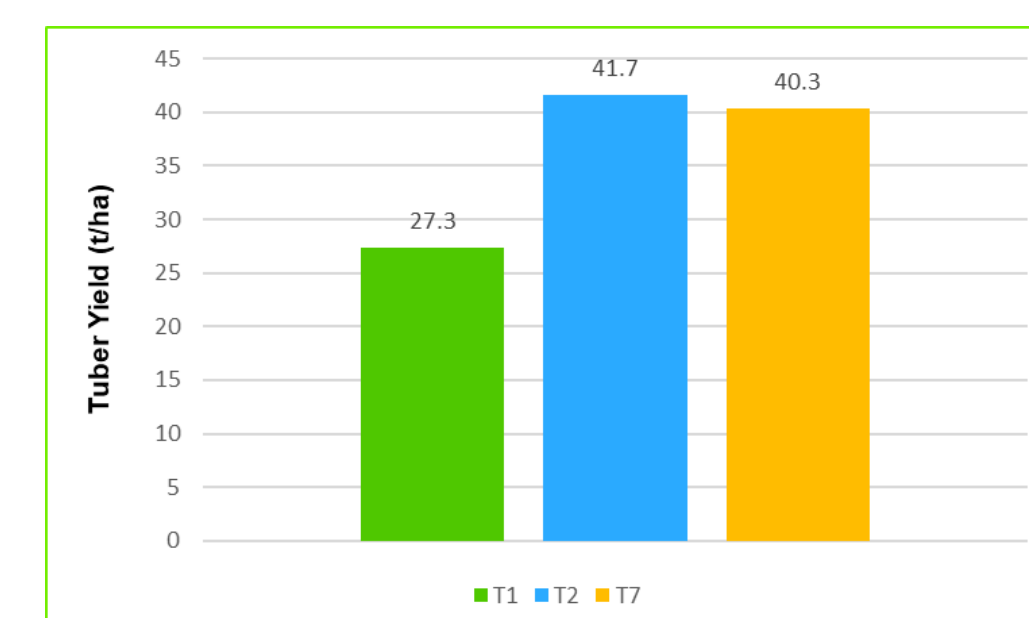
Data collection on growth parameters was followed by topdressing. Harvesting and yield data collection were completed in August, 120 days after planting.

Results

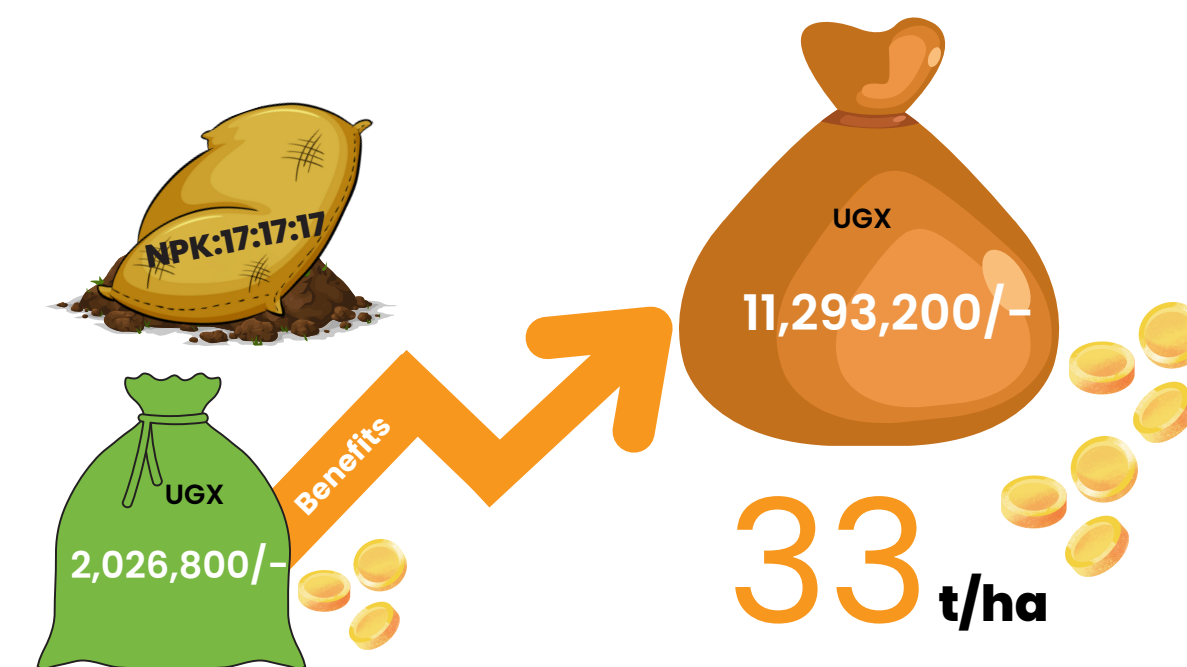
Yield Performance of T1 and T2 by Location



Yield Performance of T1 Vs. T2 Treatment



Economic Analysis of Production (T2)



T7 has the highest cost of production at UGX 3,449,400 with lower net benefits at UGX 9,611,400 at same yield of ~33t/ha.

Conclusions

The application of NPK (17:17:17) at a rate of 120kg/ha recorded higher growth and marketable yields and gave maximum economic returns. This treatment was the most effective and an economically viable option, for potato production in Elgon region.