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"Filling gaps and removing traps
for sustainable resource management"

Exploring Larger Planting and Harvest Phases to Increase Cassava Productivity in South-West Nigeria

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Abstract

Cassava (*Manihot esculenta* Crantz) is a perennial crop grown predominantly for its starchy roots in the humid and sub-humid tropics. Seasonal rainfall determines cassava planting dates and farmers have preferred harvest windows based on crop maturity and soil moisture conditions. Cassava being perennial and drought tolerant, the planting and harvesting windows can be expanded to enable year-round production. However, starch accumulation and remobilisation are regulated by physiological processes depending on environmental conditions, nutrient availability and varietal attributes. For sustainable cassava production, adequate supply of nitrogen and potassium is important to support aboveground biomass growth, root starch accumulation and improved tolerance to drought. We investigated: Growing time required to produce profitable root and starch yields; varietal suitability for late planting; NPK effects on starch yield; planting and harvesting dates with best responses to fertiliser. Trials were conducted at 3 sites, with 2 varieties (TMS980581 and TME419), planted in April, July and September, each planting harvested at 9, 11 and 13 months after planting (MAP) and 4 fertiliser levels: control and NPK at 75:20:90, 75:20:135 and 75:20:180 kg ha^{-1}. Starch and root yields were significantly affected by planting and harvest dates ($p < 0.01$) with lowest yields at 9 MAP. Root yields for first planting were 15.2, 22.7 and 26.6 Mg ha^{-1} for 9, 11, and 13 MAP, respectively; for second planting 17.7, 27.7 and 27.5 Mg ha^{-1} for 9, 11, and 13 MAP, respectively and for third planting 20.6, 33.6 and 38.6 Mg ha^{-1} for 9, 11, and 13 MAP, respectively. Starch yields were 2.8, 4.6 and 6.3 Mg ha^{-1} for 9, 11, and 13 MAP, respectively, for first planting, 3.2, 6.6 and 6.6 Mg ha^{-1} for 9, 11, and 13 MAP, respectively for second planting and 4.3, 8.8 and 9.1 Mg ha^{-1} for 9, 11, and 13 MAP, respectively, for third planting. Root yields of TMS980581outperformed TME419 but starch content was higher in TME419. Fertilised plots attained higher root yields than the control across all plantings, without significant effects of fertiliser on starch yield for second and third plantings. Strongest positive yield response to fertiliser application was found at 13 MAP.

Keywords: African cassava agronomy initiative, cassava, fertiliser, variety

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