Impact of Planting and Harvest Dates on Root and Starch Yield of Cassava and Soil Physical Properties

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Introduction

In Nigeria, cassava roots contribute a major proportion to the daily per capital food consumption, estimated at about 1.6 kg per person per day. However, availability of cassava roots for direct human consumption or to processing factories varies strongly over the year. In addition highly volatile root prices affect farmers' willingness to plant and to harvest cassava. To reduce the strain on the value chain actors, here farmers and consumers and the processing industry, this study was conducted to assess (1) the impact of planting and harvesting dates on the root yield and starch content, (2) the effect of fertilizer application on root and starch yields and (3) to determine if various harvest dates affect the soil physical properties.

African Cassava Agronomy Initiative

Young cassava crop

Determining cassava root starch content by the gravimetric method

Methodology

- Plantings are usually done between March to August
- Little or no use of fertilizer by farmers
- Harvesting between 10 and 24 months after planting (MAP)

Planting Periods:
- April (P1)
- June (P2)
- August (P3)

Fertilizer Application:
- Nil (F0)
- Fertilized (F1)

Varieties:
- TME 419 (V1)
- TMS 30572 (V2)

Harvesting periods:
- 9 MAP (H1)
- 11 MAP (H2)
- 13 MAP (H3)

Cassava Parameters:
- Root yield
- Starch content

Soil Parameters:
- Bulk density
- Clay dispersion ratio
- Total porosity

Data analysis:
R statistical package was used

Results

- Root yield increased from 9 to 13 MAP with June planting producing the highest yields (Figure 1 a). Starch content generally increased with prolonged growing periods except for April planting harvested at 13 MAP. Highest starch contents were attained in August planting (Figure 1 b) when harvested at 11 and 13 MAP.
- Fertilizer application increased the root yield and starch content of cassava (Figure 2 a and b).
- Soil physical properties were not affected by harvesting periods except for a reduced clay dispersion ratio (Table 1) at 13 MAP.

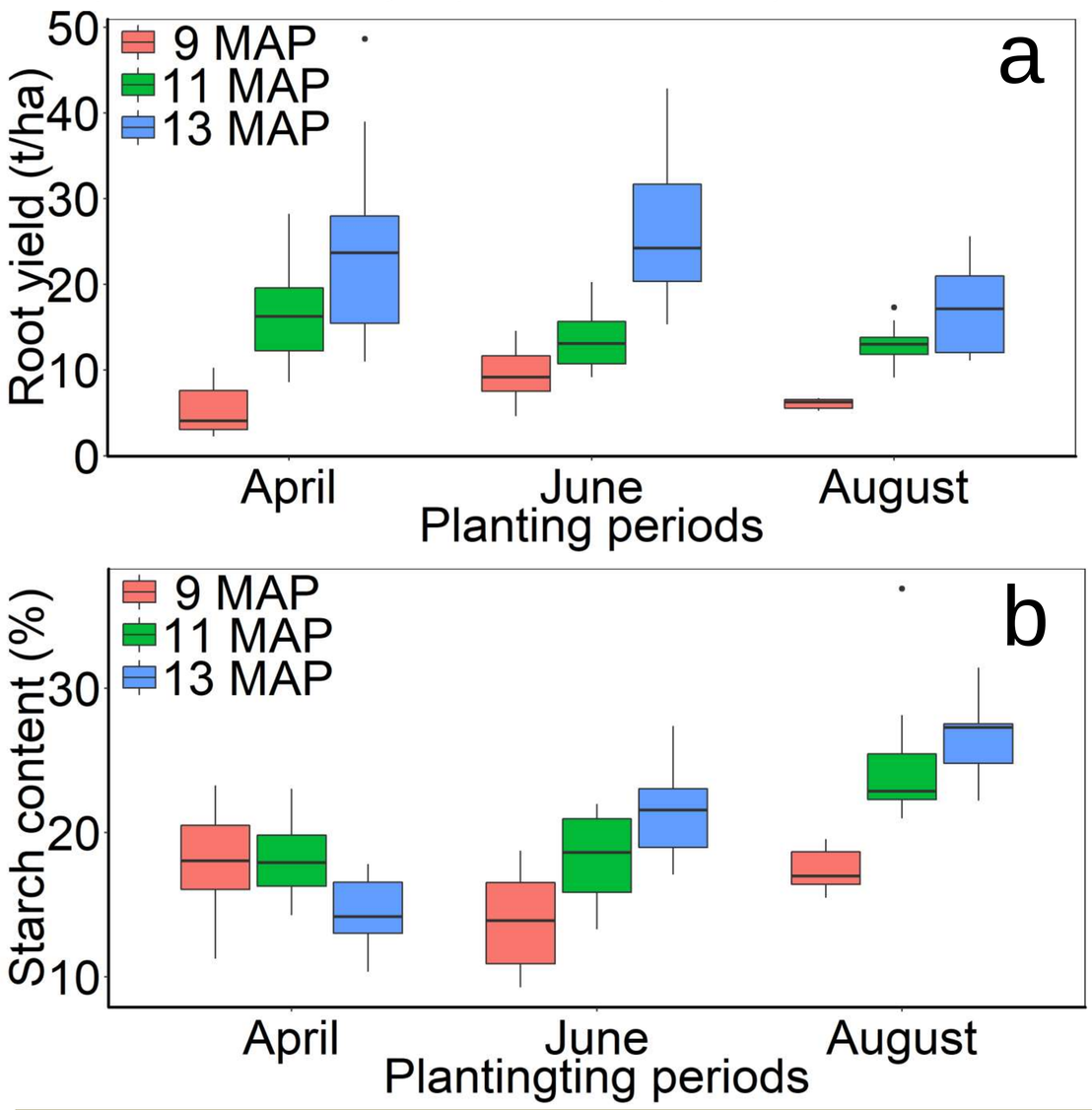

Figure 1: Effect of planting and harvesting periods on (a) cassava root yield and (b) starch content.

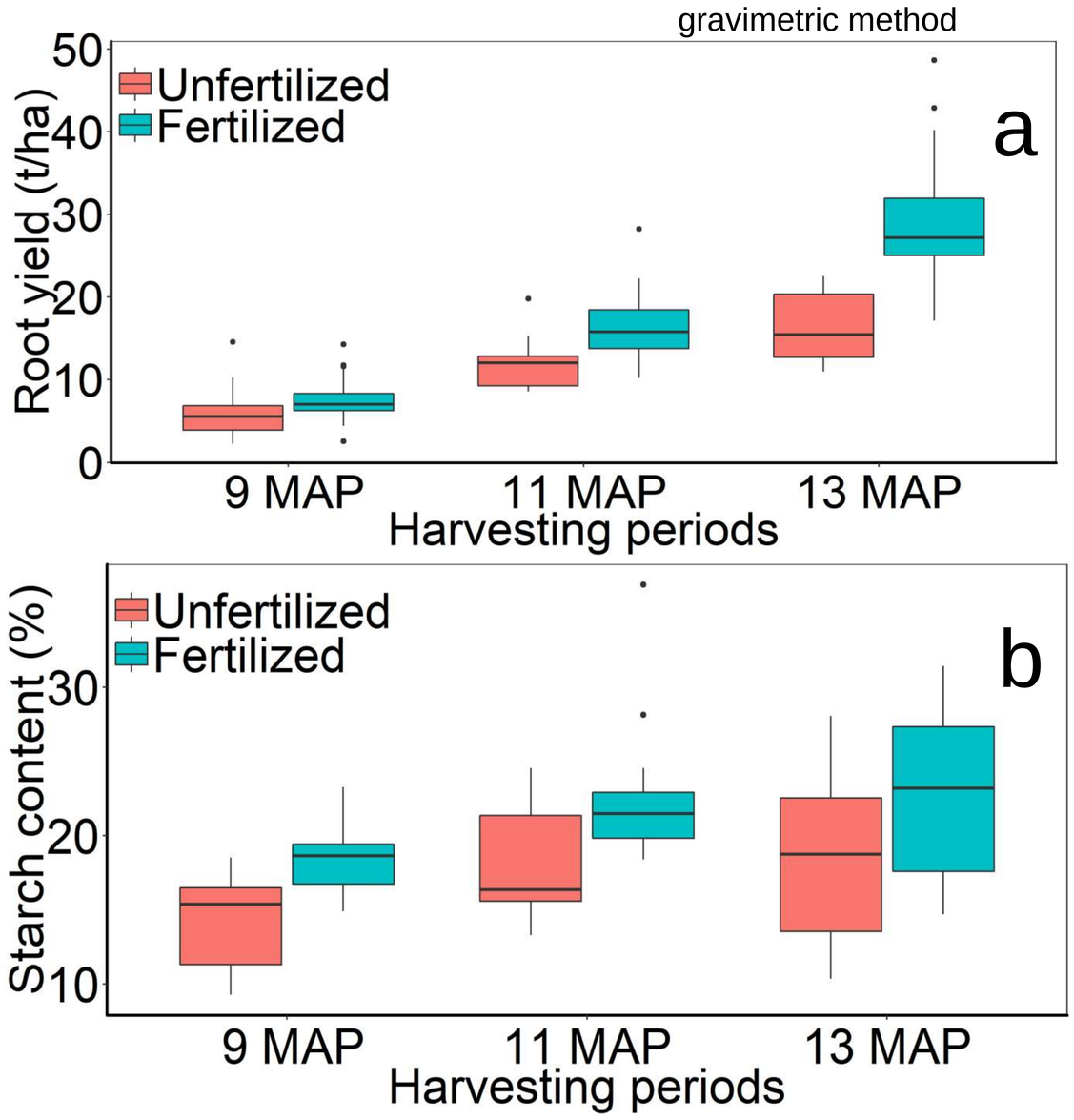

Figure 2: Effect of harvesting periods and fertilizer application on (a) cassava root yield and (b) starch content.

TABLE 1: Effect of harvesting periods on soil physical properties

Treatments	Bulk density (gcm^{-3})	Total Porosity (%)	Clay Dispersion Ratio
Harvesting Periods			
9 MAP	1.32	50.10	50.77
11 MAP	1.39	47.75	50.50
13 MAP	1.38	47.55	40.01
LSD (P < 0.05)	NS	NS	2.00

Conclusion

- Harvesting at 13 MAP and planting improved varieties like TME 419 is encouraged for higher root yield and supply to factories .
- Farmers should be encouraged to apply fertilizer to cassava as it can potentially double the root and starch yield.
- Fertilizer effects get more positive with longer growing periods.
- Soil physical properties had no significant negative response to to prolonged growing periods.

An economic analysis needs to be conducted to compare the additional income from prolonged growing periods with lost income from growing other crops in the same period.

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