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

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Abstract

Availability of cassava roots for human consumption or the processing factories is controlled by the vagaries of the harvesting time. This study was carried out to examine the effect of varying planting and harvesting dates on cassava growth parameters, root yield, starch content and soil properties. The experiment was a split-split-plot design with planting periods (April, June and August), varieties (TME 419 and TMS 30572) and harvesting dates (9, 11 and 13 months after planting (MAP) as main plot, sub plot and sub-sub plot, respectively, replicated three times. The fertilised plots received NPK 15-15-15, urea and MOP fertiliser at rates equivalent to 75 kg N, 20 kg P, and 90 kg K ha⁻¹. TME 419 produced a mean root yield of 15.2 t ha⁻¹, about 29.7 % higher than 13.0 t ha⁻¹ from TMS 30572. The starch content was 20.05 % in TME 419 and 18.45 % in TMS 30572. Cassava root yield and starch content increased significantly ($p < 0.05$) with later harvest dates. The highest root yield and starch content were recorded at 13 MAP. At 13 MAP TME 419 produced 23.95 t ha⁻¹ and TMS 30572 produced 21.35 t ha⁻¹ compared the root yield at 11 MAP and 9 MAP harvests. At 13 MAP harvest, the starch contents was 20.84 %. This was higher than 20.58 % and 16.32 % at 9 MAP and 11 MAP, respectively. Though not statistically different, the lowest soil bulk density (1.32 g cm⁻³) and highest total porosity (50.10 %) was found at 9 MAP harvest. Soil under TMS 30572 had higher saturated hydraulic conductivity than soil under TME 419 with mean of 34.58 (cm hr⁻¹) and 32.17 (cm hr⁻¹), respectively. Likewise, the Clay Dispersion Ratio (CDR) decreased with harvesting periods with 13 MAP harvest having the lowest CDR of 2.41 %. Therefore, harvesting of cassava at 13 MAP is considered more productive, irrespective of variety. The selection of the variety to be cultivated should be guided by the intended cassava root sales to fetch higher prices based on root yield or starch content. Also, changes of soil properties should be considered to support soil conservation measures and avoid rapid fertility and physical degradation.

Keywords: African Cassava Agronomy Initiative, extended planting, harvesting date, root yield, starch content