



Tropentag, September 18-20, 2019, Kassel

“Filling gaps and removing traps
for sustainable resource management”

Influence of Compost, Lime and NPK on Performance of three Cassava Varieties

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Abstract

Soil fertility is one of the major limitations to productivity of Cassava (*Manihot esculenta* Crantz). The use of different soil amendments such as fertilisers could improve the productivity of cassava and also increase the fertility of the soil. Thus, the potential of brewery-based compost, lime and NPK 15:15:15 were evaluated on the growth and yield of three cassava varieties (TMS01/1393, TMS1980581 and TMS101/0040).

The study was conducted at the International Institute of Tropical Agriculture, Ibadan, Nigeria. The experiment was a 4 factorial randomised complete block design in a split plot arrangement with three replicates. The first factor was compost application at 2 levels nil versus 5 Mg ha⁻¹; second factor was NPK 15:15:15 at 2 levels: nil versus 500 kg ha⁻¹ (equivalent to 75:33:62 kg ha⁻¹ N:P:K); third factor was lime at 2 levels: nil versus 500 kg ha⁻¹; fourth factor was the cassava variety at 3 levels: TMS01/1393, TMS1980581 and TMS101/0040, with the input combinations nested within varieties. Cassava was planted at 1 by 0.5 m distance and harvested after 12 months.

TMS01/1393 had the highest stem yield with an average of 22.65 t ha⁻¹ followed by TMS1980581 20.60 t ha⁻¹ and TMS101/0040 14.30 t ha⁻¹. Compost + lime combination gave the highest stem yield (42.54 t ha⁻¹, p≤0.0001), significantly different from other treatments.

Root yield across all treatments of TMS01/1393 was 36.96 t ha⁻¹ fresh mass (FM) and 10.29 t ha⁻¹ dry mass (DM), for TMS1980581 root fresh yield was 25.13 t ha⁻¹ and 7.01 t ha⁻¹ DM, and TMS101/0040 produced 28.00 t ha⁻¹ FM being 6.33 t ha⁻¹ DM. Combination of compost + lime had the highest yield in TMS01/1393 at 42.32 t ha⁻¹ FM (10.97 t ha⁻¹ DM) which was not statistically different from the control at 40.29 t ha⁻¹ FM (9.40 t ha⁻¹ DM). There was a significant increase over the control yield 22.14 t ha⁻¹ (5.14 t ha⁻¹ DM) of TMS101/0040 in the following combinations: compost +lime + fertiliser 36.06 t ha⁻¹ FM (8.20 t ha⁻¹ DM), compost + fertiliser 36.60 t ha⁻¹ FM (8.55 t ha⁻¹ DM), lime + fertiliser 34.85 t ha⁻¹ FM (8.36 t ha⁻¹ DM).

Keywords: Cassava, compost, lime, NPK, soil fertility