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Root Yield Response of Contrasting Cassava Genotypes to Fertiliser Application and Leaf Harvest in Nigeria

MARIELLE MOITA-NASSY, STEFAN HAUSER, PETER KULAKOW, CHRYSANTUS AKEM

International Institute of Tropical Agriculture (IITA), Nigeria

Abstract

Cassava is usually grown for the starch-rich storage roots, yet in many countries of West, Central and East Africa cassava leaves are a highly appreciated vegetable and source of protein, vitamins and minerals. Root yield responses to leaf harvest are rare, limited to DR Congo and did not investigate the effects of fertiliser on the ability of cassava to compensate the loss of foliage and root yield losses. This study investigated the response of 9 varieties to 2 levels of fertiliser application on leaf and root yield. Leaves were harvested from all shoots of all plants at 3, 5, 7 and 9 months after planting (MAP). Fertiliser was NPK 15:15:15 at 300 and 600kg ha⁻¹ in 2 dressings. Root harvest was at 11 MAP. Cumulative leaf yields were not different between varieties, ranging from 300 to 480kg ha⁻¹ DM. Fertiliser had no effect on leaf yields. Variety did not interact with fertiliser. Cassava root yield revealed 3 fertiliser per leaf harvest response types: non-responders to fertiliser with drastic yield loss due to leaf harvest; responders with a yield loss due to leaf harvest yet with fertiliser compensating for losses caused by leaf harvest and responders with a large loss due to leaf harvest and unable to compensate for yield losses when fertiliser was applied. Highest root yields were 9.87Mg ha⁻¹ in control and 8.06 Mg ha⁻¹ when leaves were harvested. Maximum root yield loss was 4.26Mg ha⁻¹ equivalent to 43 %. Above ground biomass loss, determined at final harvest) and root yield loss were weakly correlated ($r^2=0.184$). Cassava root yield loss due to leaf harvest was positively correlated with root yield in control ($r^2=0.522$), indicating that cassava varieties with a higher productivity suffer larger losses when leaves are harvested. However, the actual amount of dry matter removed in all leaf harvests was neither correlated with the root yield loss nor with the above ground biomass loss caused by leaf harvest. Varieties responding to fertiliser and able to compensate root yield losses caused by leaf harvest through application of fertiliser (here 300kg ha⁻¹ NPK 15:15:15) appear suitable candidates for dual purpose cassava production systems.

Keywords: Fertiliser, leaf harvest, Nigeria, root yield loss