

Experimental Determination of Water Productivity of Improved Cassava Varieties Propagation under Rain-Fed Condition in Tropical Environment

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Abstract : Researchers in developing countries have worked on improving cassava resistance to diseases and pests, high yielding and early maturity. However, water management has received little or no attention as cassava cultivation in Sub-Saharan Africa depended on available precipitation (rain-fed condition). Therefore the need for water management in Agricultural crop production cannot be overemphasized. As other sectors compete with agricultural sector for fresh water (which is not readily available), there is need to increase water productivity in agricultural production. Experimentation was conducted to examine water use, growth and yield of improved cassava varieties under rain fed condition using Latin-square design with four replications. Four improved disease free stem cassava varieties TMS (30572, 980505, 920326 and 090581) were planted and growth parameters of the varieties were monitored for 90 and 120 days after planting (DAP). Effective rainfall useful for the plant growth was calculated using CROPWAT8 for Windows. Results indicated TMS090581 was having the highest tuber yield and plant height while TMS30572 had highest number of nodes. Tuber stem and leaf water productivities at 90 and 120 DAP of TMS (30572, 980505, 920326 and 090581) are (1.27 and 3.58, 1.44 and 2.35, 0.89 and 1.86, 1.64 and 3.77) kg/m³ (1.56 and 2.59, 1.95 and 2.02, 1.98 and 2.05, 1.95 and 2.18) kg/m³, and (1.34 and 2.32, 1.94 and 2.16, 1.57 and 1.40, 1.27 and 1.80) kg/m³ respectively. Based on tuber water productivity TMS090581 are recommended while TMS30572 are recommended based on leaf and stem productivity in water scarce regions. Experimentation was conducted to examine water use, growth and yield of improved cassava varieties under rain fed condition using Latin-square design with four replications. Four improved disease free stem cassava varieties TMS (30572, 980505, 920326 and 090581) were planted and growth parameters of the varieties were monitored for 90 and 120 days after planting (DAP). Effective rainfall useful for the plant growth was calculated using CROPWAT8 for Windows. Results indicated TMS090581 was having the highest tuber yield and plant height while TMS30572 had the highest number of nodes. Tuber, stem and leaf water productivities at 90 and 120 DAP of TMS (30572, 980505, 920326 and 090581) are (1.27 and 3.58, 1.44 and 2.35, 0.89 and 1.86, 1.64 and 3.77) kg/m³ (1.56 and 2.59, 1.95 and 2.02, 1.98 and 2.05, 1.95 and 2.18) kg/m³, and (1.34 and 2.32, 1.94 and 2.16, 1.57 and 1.40, 1.27 and 1.80) kg/m³ respectively. Based on tuber water productivity TMS090581 are recommended while TMS30572 are recommended based on leaf and stem productivity in water scarce regions.

Keywords : improved TMS varieties, leaf productivity, rain-fed cassava production, stem productivity, tuber productivity

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