IMPETUS Benin

Fertilization Effect on Biomass Production and Partitioning Pattern of Yam

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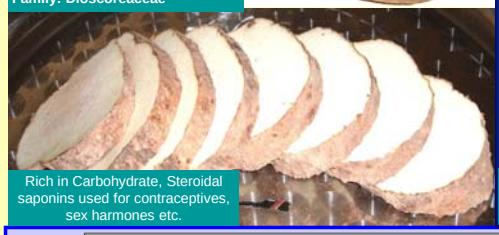
BACKGROUND

There has been a decline in yam production relative to Cassava and Rice in Africa but Yam is such a preferred staple food that , bearing in mind population increases, there will not be an absolute decline. Dry matter partitioning is of great importance in crop production, However, there are limits to the fraction of assimilates that can be diverted to the harvestable organs. The balance between assimilates for different plant parts is of importance for optimal crop production. In this present study the distribution of dry matter increments to the plant parts of white yam (*Dioscorea rotundata*) in relation to mineral fertilizer application was determined by analysing the data from field experiments set up in Dogue village, Upper Oueme basin, Republic of Benin (Figure 1).

RESULTS

1) **In year 2005, 44% incerease in tuber yield and 42% total biomass production in the fertilizer treatment has been observed (Figure 2). Whereas, in the year 2006,it was 85% and 84% incerease in tuber yield and total biomass production respectively (Figure 3).**
2) **In both year 2005 and 2006, gradual decrease in dry matter distribution in leaves and stems after 57 DAP has been registered in both fertilized and control conditions [Figure 4 (a)(b) & 5 (a)(b)].**
3) **In contrast the partitioning rate was always positive, increasing rapidly during the period between 57 and 126 DAP. Partitioning accounts for more than 90% of total assimilates in tuber both in control and fertilized condition.The same pattern was observed in year 2006 as well, tuber partitioning accounted for 97% of total dry matter assimilated [Figure 4 (a)(b) & 5 (a)(b)].**

White Yam *(Dioscorea rotundata)*
Family: Dioscoreaceae



Rich in Carbohydrate, Steroidal saponins used for contraceptives, sex harmones etc.

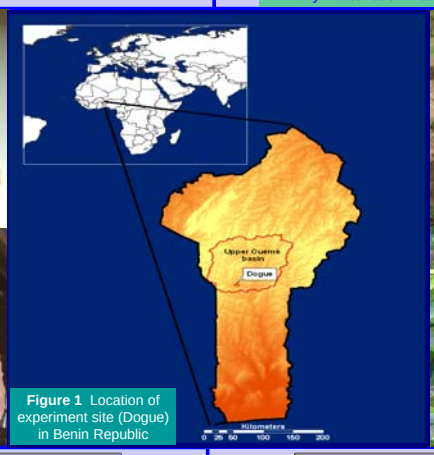


Figure 1 Location of experiment site (Dogue) in Benin Republic

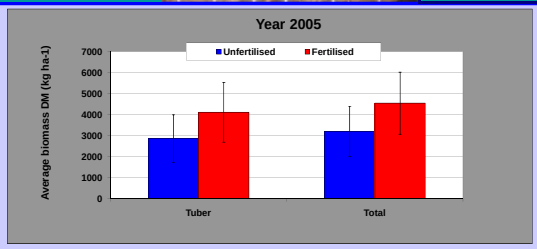


Figure 2 Comparison of Yam total biomass and tuber yield production under control and fertilized conditions

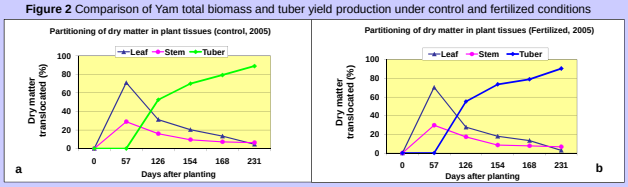


Figure 4(a) & (b) Comparison of partitioning rate of dry matter in different Yam tissues under control and fertilized conditions

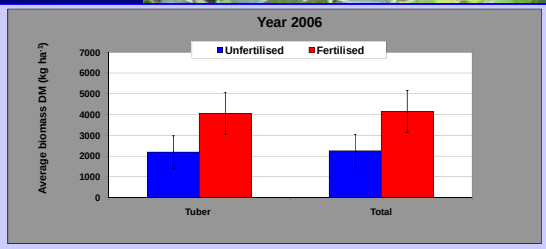


Figure 3 Comparison of Yam total biomass and tuber yield production under control and fertilized conditions

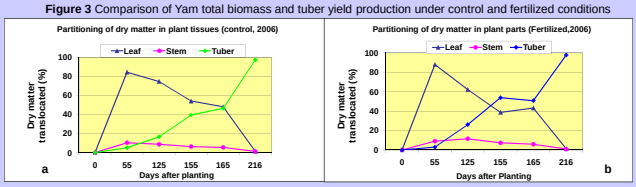


Figure 5 (a) & (b) Comparison of partitioning rate of dry matter in different Yam tissues under control and fertilized conditions

METHODOLOGY

Experiments were laid out as a randomised complete block design with three replications. Altogether there were six sub-plots (8 m x 8m) size, out of which three sub-plots were fertilized with NPK 200 kg ha^{-1} at planting, NPK 100 kg ha^{-1} (60 DAP) and Urea 100 kg ha^{-1} (60 DAP) whereas, remaining three sub-plots were kept as control. Four samples of leaves, stems and tubers were harvested at five different times of the crop cycle.

CONCLUSION

There has been highly positive significant effect of mineral fertilizer on Yam total biomass and tuber production. Dry matter distribution tended to follow a regular pattern if expressed as a function of phenological growth phase of the crop in both fertilized and control condition.

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