

## STORAGE LIFE OF ELEVEN CULTIVARS OF WHITE YAM (*DIOSCOREA ROTUNDATA*) GROWN WITH OR WITHOUT NPK FERTILIZER AND THE RELATIONSHIP WITH RESIDUAL SOIL NPK

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### ABSTRACT

A major constraint facing yam producers in southeastern Nigeria is poor storage of the tubers. Farmers in the area also opine that yams grown with mineral fertilizers tend to have shorter shelf life than those grown without mineral fertilizers. This study was undertaken to evaluate the effect of the applied mineral fertilizer on cultivar weight loss and the relationship between the weight loss and residual soil NPK. The selected (wound-free and about similar size) tubers were stored in a shaded but well ventilated traditional barn. Weight loss from tubers of eleven cultivars (ten cultivars were developed at IITA and the 11<sup>th</sup> one was a local best, Cv. Nwopoko.) of white yam (*Dioscorea rotundata*) was monitored monthly for six months following harvest in November at Nsukka, southeastern Nigeria. The tubers were from plots that received 15:15:15 NPK fertilizer mixture and those that did not receive any fertilizer. The result showed that there was a significant difference ( $p < 0.001$ ) between the loss in weight in tubers from fertilized and unfertilized plots. The average monthly loss in weight was 44% higher in tubers grown with fertilizer than those grown without fertilizer. The highest and the least losses in weight were obtained from IITA cultivars TDr 93-46 and TDr 95-127 respectively, for tubers from fertilized and unfertilized plots, while loss by the local cultivar was the second highest in both cases. A correlation of the tuber weight loss with residual soil NPK was not significant, however, tuber yield from unfertilized plots significantly correlated with residual soil K. Similarly tuber yield from fertilized plots correlated with residual total N. Some of the cultivars whether grown with or without fertilizer stored better than others. Cultivar effect was significant on weight loss ( $p < 0.001$ ) and more pronounced than fertilizer effect by more than 200%.

**Key words:** yam, NPK fertilizers, shelf life, Nigeria

### INTRODUCTION

Most of the soils in the tropics are known to be poor in fertility status (Okigbo, 1989); hence, there is the need to supplement the amount of nutrients for optimal crop performance. The poor fertility status is even more related to chemical than physical properties according to Fernandez and Sanchez (1990). Yams according to Obigbesan and Agboola (1978) are heavy feeders and thus constitute a heavy drain on the soil. They thus recommended that at least liberal dressing of mineral fertilizer is necessary for increased yields. Over 49% increase in tuber yield has been reported by Asadu (1989) from fertilized over unfertilized plots, thus supporting

the use of mineral fertilizer in yam production. However, yam farmers often opine that the tubers produced with mineral fertilizers tend to have shorter shelf life than those produced without mineral fertilizers.

Loss of yam in storage may range from 30-66% of the total output in southeastern Nigeria (Ugwu, 1995). The causes of yam tuber loss in storage as shown in earlier studies have been associated with pests, diseases, damage during and after harvest (e.g. during transportation), temperature and humidity variations as well varietal differences. Data on how the yams were grown are often not available especially the use of fertilizers. This is acute with

the inhibitors. This, however, needs further evaluation.

### CONCLUSION

The study showed that tuber weight loss could vary according to white yam cultivars when grown in southeastern Nigeria irrespective of whether mineral fertilizer was used or not. Again, cultivars grown with mineral fertilizer experienced significantly higher weight loss than those grown without fertilizer. The effect of cultivar variation was substantially higher than that of mineral fertilizer but the application of NPK 15: 15: 15 fertilizer mixture in yam production could result in reduced shelf life of tubers especially where there is no significant yield response to fertilizer application.

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