

EFFECTS OF DIFFERENT RATES OF NPK FERTILIZERS ON YIELD AND STORAGE PROPERTIES OF WHITE YAM

E.E. Umanah*

SUMMARY

Experiments were carried out for three years, 1968 to 1970, to determine the most effective rates of application of N P K on the tuber yields of white yam and to assess the effect of the fertilizers on the storage properties of the tubers. Nitrogen application gave higher yield than no nitrogen; 33.6 kg N per hectare was significantly better than no nitrogen ($P = 0.05$) for 1969 and 1970 seasons. However, no significant increase in yield was obtained by increasing nitrogen from 33.6 kg N per hectare to 67.3 kg N per hectare. Phosphate application depressed yield throughout, though not significantly. Effect of potash application on yield was inconsistent; a nonsignificant yield increase in the first year and depression in the last two years were obtained. Fertilizer applications had no significant effect on weight losses in storage.

RESUME

Des essais ont été menés pendant trois ans, de 1968 à 1970, pour déterminer les taux les plus satisfaisants d'application de NPK sur le rendement en tubercules d'igname blanche et pour évaluer l'effet des engrais sur les propriétés de conservation des tubercules. Le rendement lorsqu'on applique l'azote a été plus élevé que celui obtenu sans recours à l'azote ($P = 0.05$) pendant les saisons 1969 et 1970. Toutefois on n'a pas noté d'augmentation sensible lorsqu'on a accru l'azote de 36.6 kg à l'hectare à 67.3 kg à l'hectare. Le phosphate a un effet dépressif sur le rendement, mais à un moindre degré seulement. L'effet de l'application de la potasse sur le rendement est resté très léger; il n'y a pas eu d'accroissement sensible pendant la première année, ne de dépression pendant les deux dernières années. L'effet d'applications de l'engrais sur les pertes de stockage était peu sensible.

RESUMEN

Por tres años, de 1968 a 1970, se llevaron a cabo experimentos para determinar las dosis de aplicación más efectivas de NPK, en el rendimiento de tubérculo de ñame blanco y para establecer el efecto de los fertilizantes sobre las propiedades de almacenaje de los tubérculos. Las aplicaciones de nitrógeno produjeron mayor rendimiento que cuando no se aplicó; 33.6 kg N por hectárea fué significativamente mejor que no nitrógeno ($P = 0.05$) para las temporadas de 1969 y 1970. Sin embargo, no se obtuvo un incremento significativo del rendimiento cuando el nitrógeno se aumentó desde 33.6 kg N por hectárea hasta 67.3 kg N por hectárea. La aplicación de fosfato redujo el rendimiento, si bien que no significativamente. El efecto de las aplicaciones de potasio, sobre el rendimiento, fué inconsistente; se obtuvo un incremento no significativo del rendimiento el primer año y descenso de él, en los dos últimos años. La aplicación de fertilizantes no tuvo un efecto significativo sobre la pérdida de peso durante el almacenamiento.

INTRODUCTION

Several investigators have demonstrated positive response of yams (*Dioscorea* spp) to nitrogen fertilizer. Irving⁴ obtained a significant response to nitrogen applied as ammonium sulphate. He obtained no response to phosphorus application, and sometimes its use actually depressed tuber yield. For potassium, there was a general overall response to lower rates of application, but higher rates usually had little further effect. Significant response to K was only obtained on sites that were under permanent rotations. When yams were grown after 'bush fallow' where K was available from the burning of the bush, lower response resulted. Coursey³ has reviewed most of the literature on yams including fertilizer trials. Sobulo⁶ studying nutrient content of yams with age, found an increase in potassium content of the soil after a yam fertilizer trial.

Okafor⁵ studied incidence of rotting of yams and concluded that 5.0 to 68.5 percent of the yams rotted in storage. The objectives of this study were to investigate the response of yams to N P K fertilizer and the effect of these fertilizers on the storage qualities of yam tubers.

*Federal Department of Agricultural Research, Ibadan, Nigeria