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“Development on the margin”

Improving Market Demand and Productivity Level in an Underutilised Yam (*Dioscorea esculenta*) in Ghana: Implications for Crop Breeding and Production Choices

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Abstract

Yam (*Dioscorea* spp.), especially *D. esculenta* locally called “oboedunum” is a high value commodity. But it is also a threatened species in Ghana, due to several factors including neglect on the part of science, technology, research and development – and, more importantly, their displacement by improved varieties, mining activities, bush fires, infrastructure development and over-grazing. Their full potential for income generation both through domestic markets and the export trade has not been realised due to neglect in production, handling and trading systems as a result of its poor sizes that inhibit its use for food and agriculture in Ghana.

The purpose of this study was to improve the size and market value of *D. esculenta* using different doses of radiation to promote the effective use of these species and enhance effective conservation and sustainable use for food, agriculture and industry. We observed through repeated experiments that irradiation of yam planting material at 40 Gy gave the best results producing a M1 generation with a decreased number of tubers but with an increased tuber size per vine. The weight of these tubers was on average 1 kg against 0.3 kg for the tubers of the control (unradiated planting material).

Some characteristics are valued more than others, and prices vary across species, time, and market sites. Some residual symptoms of pest and disease damages on yam tubers reduce their market values. Tuber weight exhibits an increasing marginal value and price per kilogram increases above an optimum size; therefore, producers derive additional reward from extra-large tubers. We conclude that, to effectively access and benefit from urban markets, producers should focus on the improved size and conical shaped-tubers, which are easy to process and meet the aesthetic qualities preferred by urban consumers. The implications for research on improved variety development to reduce poverty and for crop and resource management practices are drawn.

Keywords: Breeding, demand, *Dioscorea esculentus*, Ghana, market, mutation, production, productivity, underutilised