Tropical Root Crops

RESEARCH STRATEGIES FOR THE 1980s

Proceedings of the First Triennial Root Crops Symposium of the International Society for Tropical Root Crops ~ Africa Branch
TROPICAL ROOT CROPS: RESEARCH STRATEGIES FOR THE 1980s

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GARI YIELD FROM CASSAVA: IS IT A FUNCTION OF ROOT YIELD?

D.G. IBE AND F.O.C. EZEDINMA

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Twelve cassava cultivars constituting 11 hybrids, namely TMX 30395, TMX 1325, TMX 1624, TMX 59/159/91, TMX 30568, TMX 750, TMX 6, TMX 90, TMX 20, TMX 30211 from IITA, and 60506 were harvested 1 year after being planted at the Teaching and Research Farm of the University of Nigeria, Nsukka. Marketable roots of each cultivar were labeled and 100 kg were weighed out from each cultivar and processed into gari in a semimechanized gari factory. The cultivars were grown without fertilizers as is the practice among most farmers. The results showed that the cultivar with the highest root yields was not necessarily the best for gari production. Observations on gari yield and quality in relation to root yields are discussed. Plant breeders and agronomists should consider quality and quantity of gari, rather than mere root yields, in selecting new cassava cultivars for farmers. The hybrids have a lot of promise if the gari yield can be determined by means of time-of-harvesting experiments in the various ecological zones.

Douze cultivars de manioc comprenant onze hybrides, notamment TMX 30395, TMX 1325, TMX 1624, TMX 59/159/91, TMX 30568, TMX 750, TMX 6, TMX 90, TMX 20, TMX 30211 de l'IITA et 60506 ont été récoltés un an après leur plantation à la ferme de recherche et de formation de l'Université du Nigeria, Nsukka. Ces cultivars avaient été produits sans engrais, selon les pratiques traditionnelles des fermiers. Après étiquetage des racines de chaque cultivar, 100 kg de chaque variété ont été transformés en gari dans une meunerie semi-mécanisée. Le cultivar à rendement supérieur/ha n'a pas donné nécessairement la meilleure qualité de gari. Les observations sur le rapport entre le rendement d'un cultivar et la qualité du gari sont actuellement à l'étude. Les phytosélectionneurs et les agronomes qui cherchent de nouveaux cultivars de manioc pour les fermiers devraient s'attacher à rechercher la qualité et la quantité de gari plutôt que le nombre de tubercules. Les hybrides deviendraient très populaires s'il était possible de déterminer les éléments nutritifs du gari par des expériences sur le temps de récolte dans les diverses zones écologiques.

Gari is the staple of the people in southeastern Nigeria and most of the West African countries. Balakrishnan and Sundararaj (1967) indicated that between 12 and 12.5 months after planting was the best time to harvest cassava. However, in Nigeria scarcity of food may at times force farmers to harvest their cassava just 8 or 9 months after planting. Cassava deteriorates quickly after harvest, and storage methods have not been very effective in enabling farmers to store their roots for even 10 days after harvest.

Ibe (1979) described the characteristics of top-quality gari in terms of good binding quality, low HCN, low fibre content (not more than 3%), and low moisture content of not more than 8%.

Farmers evaluate their cassava roots in terms of gari production and starch content; they prefer to grow cassava cultivars that give high root yields as well as high starch and gari yields.

The objective of this paper is to evaluate the gari yield of some TMX cassava hybrids, the overall goal being to determine which cultivars can be processed for high quality and quantity gari. One of the ways of improving the farmers' lot is to provide them with high-yielding cultivars of crops through genetic manipulation. High yields should be reflected in improvements in the economic well-being of the farmers. Hahn (1978) indicated that the cassava ideotype should be short, with little branching to conform to mechanization, early maturing, and resistant to pests and diseases, and should contain enough starch. Some of the TMX cassava cultivars discussed in this paper are tending to conform to Hahn’s description of cassava plant ideotype.

MATERIALS AND METHODS

Twelve cassava cultivars (TMX 30395, TMX 1325, TMX 1624, 631024, TMX 59/159/91, TMX 30568, TMX 750, TMX 6, TMX 90, TMX 20,
TMX 30211) and a control (60506) were grown without fertilizers in a randomized, complete block design with four replications. These were planted in September 1977 and harvested during the first week of October the following year. All the harvested, marketable roots were bulked according to cultivars. Thereafter, 100 kg of each cultivar were peeled by 10 gari producers who were engaged specifically to simulate village production.

After being peeled, the roots were washed and grated immediately. The grated roots or pulps were bagged and stacked in a dewatering device situated at the factory. Four days later the pulps were sieved according to cultivars and fried, the gari producers taking part in the frying of each cultivar. The fried gari was kept in a drying chamber overnight to cool and was weighed the next day for a determination of the gari yields.

**RESULTS AND DISCUSSION**

The figures obtained suggest that root yield per se is not necessarily a reliable indicator of the amount of gari that can be produced from the cultivars. Gari yield and quality varied sharply from root yields of the various cultivars. 631024 gave the highest root yield (21.5 t/ha) but not the highest amount of pulp for gari production. TMX 30568 gave the highest yield of gari in t/ha, but the gari was not high in quality. TMX 750 produced the smallest amount (0.9 t/ha) and the worst quality gari. The cultivar that produced the highest root yield, 631024, produced only 9%, or 1.9 t/ha, fried gari. However, 631024 ranked highest, followed by the control (60506) and TMX 1325 in terms of quality of gari.

TMX 30211 gave a root yield of 17.4 t/ha and a gari yield of 16%, or 2.7 t/ha; TMX 30568 gave 15.7 t/ha for roots and 20%, or 3.1 t/ha, for gari. TMX 1325 produced 14.9 t/ha for roots and 16.8%, or 2.5 t/ha, for gari. TMX 90 yielded 14.8 t/ha for cassava roots and 3 t/ha for gari. For TMX 59/159/91 and TMX 20, the root yields were 14.1 and 14.0 t/ha, respectively. However, TMX 20 produced a gari yield of 11.9%, or 1.7 t/ha, compared with 6.7%, or 1.0 t/ha for TMX 59/159/91.

It is important to consider gari processing as one of the reliable means of assessing cassava hybrids. Farmers may easily avoid use of hybrid cultivars for producing specific foods if their first attempt is a disappointment. Most of the cultivars in our study grew very vigorously without fertilizers; however, the yields were generally low because the cultivars were grown on marginal lands.