Pages 1-3

Influence de la date de récolte sur la qualité des racines de manioc destinées à transformation en foufou et bobolo

G. Tiky-Mpondo

Résumé

Les effets de 3 dates de récolte de manioc (12, 15 et 18 mois après plantation [MAP]) sur la qualité des tubercules de manioc après stockage, étuvage et rouissage ont été évalués. Les résultats ont montré qu'au delà de 12 MAP, il y a apparition d'une zone jaunâtre au centre de la racine, qui a augmenté avec le temps; cette zone a occupé 50% du volume de la racine 15 MAP et 60% à 18 MAP. Les rendements en *foufou* ont été de 27% (racines épluchées) 12 Map, 16% à 15 MAP et 15% à 18 MAP; ceux de *bobolo* ont été de 2, 44 *bobolo* de 230 g/kg à 12 MAP, 1,47 à 15 MAP et 1, 38 à 18 MAP.

Mots clés: manioc, date de récolte, transformation, foufou, bobolo

Pages 3-8

Genotype x environment effects on cassava response to the green mite (*Mononychellus tanajoa)*

E.N. Nukenine, A.G.O. Dixon and J.M. Ngeve

ABSTRACT

Genotype x environment (G × E) interactions frequently complicates breeding efforts and delay progress in selection. The cassava green spider mite (CGM) (*Mononychellus tanajoa* Bondar) is a serious constraint to cassava production in Africa. Nine cassava genotypes were grown at 6 representative locations for 3 years to study G × E interaction patterns for the reaction of cassava genotypes to CGM, and to identify genotypes with stability to the pest, using the additive Main Effects and Multiplicative Interaction (AMMI) statistical model. Environments, genotypes and G × E interactions were highly significant ($p<0.01$) for the pest. The G × E interactions accounted for 24.7%, of the treatment sum of squares for CGM, and influenced the relative ranking of genotypes across environments. The magnitude of the G × E interaction effect for CGM was higher than that for genotypes. Clone 63397 had the smallest interaction for CGM, showing stability in response to the pest across agro ecologies. TME 1 suffered the least damage across the 18 environments. Examination of the G × E interaction structure revealed specific areas where screening of cassava genotypes for resistance to the cassava green mite could be best done.

Key words: AMMI, cassava, genotype x environment interaction, cassava green mite *Mononychellus tanajoa*

Pages 8-12

Performance of new hybrid yam (*Dioscorea rotundata* Poir.) varieties under different cropping systems

G.O. Agbaje, A.A. Adegbite, T.A. Akinlosotu & S.A. Shoyinka

ABSTRACT

Four hybrid yam varieties (TDr 89/02665, TDr 89/02565, TDr 87/00559, TDr 89/02677) and a local cultivar (TDr 93-1, ex- Abuja) were evaluated for tuber yield, response to mosaic diseases and soil-borne pests under three yam-based cropping systems (sole yam, yam + maize, and yam + maize + melon) in 1997 and 1998. The results showed that tuber yields decreased under intercrop mixture. The reduction was up to 22% in yam + maize and 33% in yam + maize + melon when compared with sole yam. The highest tuber yields of 16-24 t/ha in 1997 and 24-26 t/ha in 1998 were obtained from TDr 89/02665, TDr 89/02565 and TDr 89/02677. Tuber yields from TDr 89/0059 and TDr 93-1 were the lowest, < 13 t/ha in 1997 and < 16 t/ha in 1998. Reaction of varieties to leaf mosaic was consistent for the 2 years, TDr 89/02665 was hardly infected, TDr 89/02565 showed mild infection while the other varieties were moderately infected. Pest (yam beetles, *Heterolygus meles* Billb, nematodes and mealybug, *Planococcus halli* Ezzat & Mc Connel) attack on tubers were mild and varietal differences were not observed except in 1998 when nematode attack was severe on TDr 89/02565 and TDr 89/02677 more than in other varieties. In the 2 year trial, intercrop system neither influenced the severity of mosaic disease nor the attack of tuber pests. From our findings, TDr 89/02665 rated as the best variety for its resistance to mosaic disease; nematode and high yield. It is also noted that there is the possibility of breeding yam varieties for multiple diseases and pests' resistance and this enhance yam tuber yield in Nigeria.

Key words: yam, cropping systems, Nigeria, virus, leaf mosaic

Pages 12-17

Investigations on the spread of the spiraling whitefly (*Aleurodicus dispersus*, Russell) and field evaluation of elite cassava populations for genetic resistance

J.A.N. Asiwe, A.G.O. Dixon, .E.N. Jackai & E.N. Nukenine

ABSTRACT

Studies were conducted at the International Institute of Tropical Agriculture, (IITA) to study the incidence and spread of the spiralling Whitefly (SWF) (*Aleurodicus dispersus*) at the IITA campus in Ibadan, Nigeria, and the response of some of IITA's elite cassava germplasm to infestation by this pest. *A dispersus* was recorded only in the experimental areas planted with cassava and a few other host plants, or where there was heavy traffic of people and materials. Evapo-transpiration and temperature influenced the severity of infestation of *A. dispersus* more than other weather factors. Intensity of infestation significantly decreased with distance from the source of infestation (or epicenter) [Y=2-391-0.264x; R^2=0.90, $P < 0.05$]. The cassava cultivars tested showed a wide range of responses to infestation by this insect suggesting the presence of variable genetic resistance.

Key words: A. *dispersus*, cassava, infestation, population intensity, resistance, spread, weather factors

Pages 18-19

Patterns and locations of sprouts on intact tubers of a multiple sprouting *Dioscorea rotundata* Poir. variety, Pepa

B.A. Aighewi, R. Asiedu, M.O. Akoroda

ABSTRACT

Tubers of most varieties of white Guinea yam, *Dioscorea rotundata* Poir, produce a single sprout in the proximal region after they break dormancy. The location and pattern of sprout formation of intact tubers of a multiple sprouting variety, Pepa were studied. Only 0.4% of the tubers had single sprout at the proximal apex of the tuber, while 85.5 produced a bunch of sprouts in that region. Up to 96.1% of tubers had sprouts only in the proximal region, while a small proportion had sprouts all over the tuber (1.2%), only in the middle portion (0.3%), or only in the distal (tail) portion (0.8%).

Key words: *Dioscorea rotundata*, multiple sprouts, sprout pattern and location

Pages 20-23

Seed yam (*Dioscorea rotundata* Poir) production, storage, and quality in selected yam zones of Nigeria

B.A. Aighewi, M.O.Akoroda & R. Asiedu

ABSTRACT

The unavailability of good quality seed yams (*Dioscorea rotundata* Poir) is frequently cited to be responsible for the slow rate of growth or decline in yam production. Current production and storage practices, as well as quality of seed yams in 35 villages of Oyo North, Asaba, Lokoja, and Lafia areas of the yam belt of Nigeria were studied in a survey involving 299 farmers that were interviewed using a questionnaire. Over 57% of the farmers used seed yams from their farms for propagation. All farmers practiced double harvesting in combination with some other traditional methods of seed production. Between 50.0 and 65.0% of farmers in Asaba treated seed yams with purchased chemicals before planting to protect against yam beetle attack, while in other locations less than 35.0% did any form of treatment. Storage in situ or planting shortly after harvest was widely practiced in Oyo North, Lokoja and Lafia areas. In Asaba, storage was done for longer periods in yam barns. The yam beetle and scale insects caused much damage to seed yams in Asaba and Lokoja, respectively. Forty seven to 90% of farmers had a combination of pests and rots on their seed yams. The high level of loss and poor quality of seed yams in some yam zones of Nigeria are due to the pests and diseases, which are favoured by current production and storage, practices.

Key words: Dioscorea rotundata, production, quality, seed yam, storage

Pages 24-28

Genotypic variability for cassava tuberous root development in two low-altitude and mid-altitude savanna sites of Nigeria

S.O. Akparobi, I.J. Ekanayake and A.O. Togun

ABSTRACT

Cultivated cassava (*Manihot esculenta* Crantz) genotypes are relatively sensitive to low temperature stress injury. The objective of this field study was to elucidate tuberous root development and growth differences among improved and local genotypes under lowland (higher seasonal temperature) and mid-altitude (lower seasonal temperature) savanna growing conditions. Therefore genotypic differences of the onset of tuberization, tuberous root number and dry tuberous root weight changes of 12 cassava genotypes were examined at 2 field sites (Jos: 18°C ± 5°C, Ibadan: 27°C ± 6°C) and 2 seasons (1994/95 and 1995/96).Genotypic differences were significant ($P < 0.05$) among the genotypes both across locations and within locations for all traits. Significant differences ($P <0.05$)in root number and weight were observed between the 2 locations irrespective of sampling period (3, 6, 9, and 12 months after planting).Early initiation of tuberous roots was observed in TMS 4(2) 1425, TME 1 and TMS 30572 at both locations. The improved clones TMS 30572, TMS 4 (2) 1425, TMS 91934 and landraces TME 1 and Oko-Iyawo had higher root numbers than the others. At Ibadan, TMS 30572, TMS 4(2) 1425 and TME 1completed tuberization earlier while at Jos, TMS 30572 and TME 1 were the earliest to tuberize. TMS 30572, TMS 4(2) 1425, TMS 91934 and TME 1 had higher root number and weight than other genotypes at Ibadan. In mid-altitude sites, Danwaru, TME 1 and TMS 30572 performed better. Our results confirmed that low temperatures affected both developmental event associated with tuberization and growth such as root number size. Mid-altitude conditions induced a delay in the onset of completion of tuberization. The desirable traits associated with mid-altitude adaptation were early initiation of tuberous roots, larger number of tuberous roots, and high dry root yield. Some of the genotypes identified as adapted to mid-altitudes with seasonally low temperatures may be useful as parental sources in breeding programs targeted for mid or high altitudes.

Key words: *Manihot esculenta* Crantz, tuberization, root yield, adaptation, clone, landrace, yield components, savanna

Pages 29-32

Pricing conduct of spatially differentiated markets: the case of cassava roots in Delta State, Nigeria

R.N. Okoh & J.O. Akintola

ABSTRACT

The paper studied the pricing behaviour of cassava roots in 4 spatially differentiated markets in Delta State of Nigeria. Its major objective was to determine the existence of independent pricing as well as price co-operation (either instantaneous or delayed) in markets where imperfect market conditions exist. Hence independent pricing, price matching with instantaneous price changes were tested. Some 12 autoregressive models were estimated to determine the price behaviour in the cassava roots markets. Series of monthly cassava root prices for each location, covering the period January 1992 to December 1996 were employed for the analysis of cassava roots spatial price behaviour. The results showed that the cassava roots markets are poorly integrated. The coefficients of the contemporaneous price effects of the auto regressive models which range from 0.015 to 0.836 {all significant ($P < 0.05$)} suggest the presence of independent pricing and the absence of perfect price co-operation. Other results show that responses to contemporaneous price changes are not generally delayed. Thus there is an absence of any tacit price co-operation arrangement.

Key words: cassava root, Nigeria, pricing, market

Pages 33-37

Anatomical studies on the roots of some *Dioscorea* species (Dioscoreaceae)

H.O. Edeoga

ABSTRACT

Anatomical studies on the roots of ten *Dioscorea* species are reported. An analysis of the features of the internal arrangement of the leathery, non-storage root shows that these taxa posses vital characters that could be used in their description, characterization, recognition, identification and classification. The number of vascular bundles, nature of vessels, form of endodermis and cortex are some of the characters assessed and discussed among the *Dioscorea* species investigated. The relatively large number of vascular bundles in *D. alata* and *D. smilacifolia* distinguished these species from other *Dioscorea* species studied. The presence of cambium-like features in the root of *D. dumentorum* and the availability of special cell inclusions and starch grains in the root of *D. smilacifolia*, distinguished the taxon from other species studied. The well-developed endodermis in most of the wild species of yams studied could be an anatomical adaptation helping the plants to compete favorably in the wild. These observations in the *Dioscorea* species are relevant in the systematic and biological consideration of the *Dioscorea* species.

Key words: Anatomy, *Dioscorea*, Dioscoreaceae, systematic, taxa

Pages 38-42

Effect of processing conditions on the physico-chemical properties of flours from cassava (*Manihot esculenta* Crantz), sweet potato (*Ipomoea batatas* L. Lam.) and white yam (*Dioscorea rotundata* Poir.)

C.I. Iwuoha & M.I. Nwakanma

ABSTRACT

Tubers of cassava (CS), sweet potato (SP) and white yam (WY) were fermented, boiled and baked. Some physico-chemical properties of the processed tuber flours were evaluated against the raw ones. Results showed that boiling affected the greatest increase in tapped bulk density (TBD) of WY (32.85%) while the least was in fermented cassava (7.31%). Water swelling capacity (WSC) increased the most in CS (222.12%) due to boiling. The SP had the highest cold-slurry viscosity (CSV) in magnitude, as a function of both tuber type and processing condition but the greatest % increase was in boiled CS (53.13%), the least was in raw WY (-14%). Baking suppressively affected WSC and CSV as against TBD and gelatinization point (GPT) whereas banking and fermentation tend to impart better thickening and bulking qualities in the processed tuber flours. Statistical analyses at multifarious levels of confidence indicated that, except for WSC where only processing condition factor was prominent, both tuber type and processing conditions are very crucial factors in determining or influencing the physico-chemical properties of tuber flours. This preliminary study has shown that flours with diverse physico-chemical features can be produced with great prospects for applications in food formulae.

Key words: cassava, sweet potato, white yam, processing condition, flour, physico-chemical property

Pages 42-45

Influence of K-fertilizer treatment, variety, and age at harvest on shelf-life of sweetpotato under life-shade barn

P.A. Okwuowulu & J.E. Asiegbu

ABSTRACT

Sprouting is a great source of loss during storage of sweetpotato. The rate of sprouting decreased as the duration of storage increased from one to three months and differed significantly at (P = 0.05) among 4 sweet potato varieties. Variety TIS 8441 sprouted most and TIS 2534 least. Weight loss and rotting also differed significantly among varieties. TIS 8441 suffered most and TIS 87/0087 or TIS 2534 least. Harvested age significantly affected storability. Roots harvested early (3 months after planting) deteriorated most as a result of sprouting and weight loss but rotted least. Roots harvested late (5 months after planting) were most prone to rotting during storage. K-fertilizer application did not significantly induce more sprouting, loss in weight, or rotting. Treatment interaction effects were not of a definite trend. Tuber losses through the various factors were similar for all varieties but significantly better (P = 0.05) in the first year of study.

Key words: sweetpotato, K-treatments, harvest age, storability weight loss, sprouting, rotting

Pages 46-48

Effect of moisture content on physical properties of Tigernut (Cyperus esculentus)

O.J. Ijabo, J.S. Alkali & A. Alabi

ABSTRACT

Tigernut (*Cyperus esculenta*) popularly called *aya* by Hausas of northern Nigeria is a very nutritive crop whose mechanized processing is hampered probably by the absence or death of knowledge of its physical properties. This study investigated the effect of moisture content on selected physical properties of black variety of tigernut tubers. The properties are size, shape, densities, porosity, grain count per kilogramme and coefficient of friction on four structural surfaces. The mean of several replications were subjected to analysis of variance and linear regression. Experimental results revealed that moisture content has a significant effect on size, sphericity and seed count per kilogramme. Black variety exhibits isometric shrinkage during drying. Largest mean diameter is the best size index as it has the highest linear correlation coefficient in this study. The size of the black variety ranges from 11.50 to 13.66 mm. Glass has the least mean coefficient of friction of 0.32 while that of mild steel, plywood and concrete are neither significantly different from each other nor affected by moisture content level; their values range from 0.65 to 0.79.

Key words: tigernut, physical properties, sphericity, porosity, isometric shrinkage

Pages 49-52

Assessment of storage losses in roots and tubers in Niger State, Nigeria

B.A. Alabadan

ABSTRACT

Root and tubers are very important staple food crops from a major part of the diet of millions of people. Their production and movement to the final consumers are of primary importance to all. Quantitative assessment of storage losses in yam (*Dioscorea* spp.), cassava (*Manihot esculenta*) and sweet potato (*Ipomoea batatas*) were carried out through questionnaire and interview in Gurara, Shiroro (now Shiroro and Munya) and Wushishi (now Wushishi and Mashegu) Local Government Areas (LGAs) of Niger State that are notable producers of these crops. Results showed that the level of losses were associated with the methods of harvesting, post-harvest handling and storage. As much as 20.6%, 20.9% and 22.85% of stored yam tubers; 24.3%, 15.8% and 32.84% of stored cassava and 37%, 4.6% and 32.61% of stored sweet potato were lost annually in Gurara, Shiroro (now Shiroro and Munya) and Wushishi (now Wushishi and Mashegu) LGAs respectively. Practical ways of reducing these huge losses such as proper handling during harvesting and transportation, using efficient storage structures and storage in dried or processed forms were recommended.

Key words: storage losses, yam, cassava, sweet potato, Nigeria