Pages 1-6

Marketing system and spatial price differentiation of ginger in Nigeria

G.N. Asumugha, J.E. Njoku & F.I. Nweke

ABSTRACT

Ginger (*Zingiber officinale*) is an important cash crop in Nigeria. It is used as spice in confectionary and bakery industries, in culinary as well as soft drink concentrates, and in perfume and pharmaceutical industries. This paper tries to x-tray the domestic system of marketing of ginger in Nigeria. It also focused on the spatial price differential of ginger as a measure of marketing efficiency. Results showed that the marketing system is composed of intermediaries at different exchange points. There is little and very low level of ginger market integration in Nigeria. The paper concludes by making recommendations for improvements of ginger marketing in Nigeria.

Key words: Nigerian ginger, domestic market, spatial price differencial

Pages 6-9

Incidence and severity of virus-like symptoms on yams in northwestern Tanzania

J. Ndunguru, S.C. Jeremiah & R. Kapinga

ABSTRACT

A survey was conducted in the major yam growing areas of Kagera region (northwestern Tanzania) between September and October 199 to determine the incidence, severity and distribution of virus-like symptoms on yams and to assess farmers' knowledge of the symptoms. The results revealed that out of a total of 31 farmers' yam fields examined, symptoms were observed in 27 (87%) fields. Twenty-seven of the farmers grew *Dioscorea cayensis* and only 4% grew *D alata*. Incidence ranged from 10% to 100% in the affected fields and was high in fields located in Bugabo (70%) and Bukoba (77%) urban divisions in the vicinity of the Lake Victoria. The symptom severity score averaged 3.2 and 2.8 respectively and may be a result of a long history of yam cultivation in the areas. In other divisions west of Bukoba district, yam is grown in banana and plantain fields by few farmers and there was a low symptom incidence in such fields (averaging 15%). The most common symptoms seen were leaf mosaic, mottling, and sometimes distinct green vein banding. In other fields, affected plants expressed leaf crinkling and shoe-stringing and were stunted. Of the interviewed farmers only 7 (22.6%) recognized virus-like symptoms. Those who indicated familiarity with virus-like symptoms did not practice any control measures. This is the first description of virus-like symptoms on yam in Tanzania. The findings suggest that efforts to intensify and expand yam production in Tanzania should go hand in hand with identification of the casual agent(s) of the symptoms and appropriate control measures.

Key words: incidence, yam, severity, virus-like symptoms, Tanzania

Pages 10-13

Sensory evaluation of porridges containing pre-gelatinised yam (*Dioscorea rotundata*) flour in the Caribbean

N. Gill & N. Badrie

ABSTRACT

Effects of adding varying levels of pre-gelatinised dehydrated yam (*Dioscorea rotundata)* on the sensory qualities of porridges were investigated. The yams were boiled in water for 30 min, extruded in a convection oven at 65ºC or 80ºC to obtain moisture content of <10%. Dehydrated yam was added at 15% or 20% (w/v) to a formulation base consisting of water (47.5%), milk (47.5%) and sucrose (5%). The yam was first added to the water and allowed to thicken at 90-95ºC for 15min before adding the other ingredients. Drying temperatures had no effect ($p>0.05$) on sensory colour, taste, mouth-feel and overall acceptability. Panelists significantly ($p<0.001$) preferred the mouth-feel and indicated greater overall acceptability (2.60-2.93; liked a little to neither liked nor disliked) for porridges which had 15% yam as compared to treatments with 20%.

Key words: Dioscorea rotundata, pre-gelatinised, temperature, drying, porridges, sensory qualities

Pages 13-14

Producing seed yams (*Dioscorea rotundata* Poir.) from young sprouts

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

ABSTRACT

Conventionally, the tuber is the only means of propagating white yams and it is very expensive. Yam sprouts which are normally cut off from tubers in storage and discarded were evaluated as an alternative means for producing seed yams. The critical period for plant survival was between 4-6 weeks after planting. In 1994, 3.2% of sprouts from local variety Pepa established and survived until harvest, compared to 32.3% of local varieties Abi. In 1995, 56.7% of sprouts from Pepa survived till harvest. The mean tuber weight produced from Pepa sprouts was 1808.0 ± 255.1 g and 522.8 ± 30.3 g in 1994 and 1995, respectively, while for Abi it was 277.4 ± 20.7 g in 1994. In 1994, 71.4% of Pepa stands produced tubers weighing 1 kg or more. Hitherto unutilized yam sprouts could serve as planting material for the production of seed and ware yams.

Key words: seed yam, Dioscorea rotundata. Production, young sprouts

Pages 15-17

Swelling of yam flour as affected by tuber variety, processing method and analytical temperature

C.I. Iwuoha & C.J. Nnanemere

ABSTRACT

The swelling index (SI) of flours (≤500 microns) were evaluated as a function of yam tuber variety, processing method or premilling treatment and flour analytical temperature. Results showed that all these factors very significantly (P≥0.001) influenced the swelling index (SI). Using raw flour to assess the effect of yam tuber variety showed that yellow guinea yam (YGY) exhibited the greatest SI (2.83), secondly by water yam, WTY (2.46) while the least (1.89) was from white guinea yam (WGY). For the processing method factor, steaming (1 atm, 100°C, 10-60 min) effected the highest SI (3.53) which was statistically equal to 3.36 from boiling (water, 96±2°C, 2-6 days) experiment was 2.57 and not significantly different from the raw tuber flour sample of SI = 2.72. The highest change in SI caused by steaming was- 11.28% (WGY) while the least was -3.65% (YGY). Boiling effected the greatest change in WGY (22.75%) and the least 11.54% (YGY). Fermentation caused the very greatest change of all in WGY (24.34%) and the least in YGY (-25.09%). The analytical temperature factor resulted in the greatest significant (P≤ 0.05) SI at 80°C (3.83) secondly at 60°C (2.93) and the smallest =2.38 (30°C) Among raw flours, the greatest increase in SI was 43.39% (WGY) while the least was 15.85% (WTY). Among the flours from processed tubers, The greatest increased caused by analytical temperature factor was106.80% (60-min-steamed (WTY) while the least was (4-day-fermented WTY.

Key note: swelling index, flour, white guinea yam, water yam yellow guinea yam, steaming

Pages 18-21

Fermentation and protein enrichment of rumen digesta and cassava pulp, and their evaluation as diets in growing swiss rats

O.U. Ezeronye

ABSTRACT

The protein content of rumen digesta mixed with pulped cassava enhanced by fermentation using a mixed culture of yeast and bacteria namely: *Geotrichum candidum, Lacto bacillus plantarum, Enterococcus and Candida tropicalis.* After three days of fermentation microbial population (Bacteria plus yeast) increased with microbial succession as the fermentation progressed. The crude protein value also increased with the increasing microbial population from an initial value of 5.6% to 18.2%. Decrease in P^H value from 7-3.5 enhance growth of lactic acid bacteria. The dewatered and dried slurry obtained after fermentation was used to formulate murine diets. No motalities were recorded on experimental feeding of the rats on the new diet formulation. The new rations compared favourably in percentage digestibility with a commercial murine feed. The results form a base for further work on the use of rumen digesta for monogastric animal feed production.

Key words: fermentation, protein enrichment, rumen digesta, cassava

Pages 21-24

Seed yam production from pre-sprouted minisetts with varied thickness of storage parenchyma

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

ABSTRACT

A large proportion of harvested yams (Dioscorea rotundata) is used as planting material and contribute immensely to the overall cost of production. Four thicknesses (5,10,15, and 30-40 mm) of minisetts of two yam varieties were pre-sprouted in shredded coir and grown in the field to determine their suitability for producing seed yams. Variety Abi had a better sprouting ability, and more plants survived at harvest than variety Pepa. The number of sprouts/sett was highest for the thinnest (5 mm) setts. The percentage of plants that survived till harvest was significantly higher for the 5 mm-thick setts than 30-40 mm-thick setts. In 1995, there were only slight differences among the thicknesses in total seed yam yields. Abi produced more seed yams which weighed <400 g, while Pepa yielded more tubers >400 g. Only in 1995 did the 10, 15 and 30-40 mm-thick setts yield remarkably more tubers of 800-1000 g as compared to the 5 mm-thick setts. With the 5 mm-thick setts being comparable to the other thicknesses in the yield of seed yams of 150-250 g, they could be utilized for seed yam production, while more of the storage parenchyma of the tubers is used for food.

Key words: seed yam, Dioscorea rotundata, pre-sprouted minisetts, minisett thickness

Pages 25-28

Influence de la conservation au froid sur les gels d'amidon d'igname *(Dioscorea* spp) de Côte d'Ivoire

F.A. Tetchi et N.G. Amani

ABSTRACT

La synérèse des gesl d'amidon de 19 cultivars d'igname *(Dioscorea*) appartenant à 4 espèces et complexe d' espèces été déterminée après conservation pendant 8 semaines. La résistance à la synérèse a varié selon l'espèce étudiée et la température de stockage. A 4°C, la synérèse évolue en moyenne entre 30% et 50%. La résistance des espèces sont classifiées comme suit: *D. alata* > *D. esculenta* > *D. cayenensis-rotundata* > *D. dumentorun*. Les cultivars "Daminangba" (D. alata) et "Assawa" (D. cayenensis-rotundata) se distinguent par leurs faibles synérèse d'environ 20%. Après congélation (-20°C) et décongélation, la synérèse évolue de 40 à 55%. Et la résistance des espèces à la congélation et décongélation donne dans l'ordre décroissant, *D. esculenta ~ D. dumetorum* > *D. cayenensis-royundata* > *D. alata*. Le cultivar "Kpokpokpokpo" (*D. cayenensis-rotundata*) se distingue par sa faible synérèse (38%)

Key words/Mots clés: synérèse, congélation/décongélation, amidon, igname

Pages 28-31

Production of seed yams (Dioscorea rotundata Poir) using yam peels

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

ABSTRACT

Large quantities of yam (*Dioscorea rotundata* Poir.), up to 30% of harvested tubers is usually reserved as planting material for the next crop. The experiment was conducted to assess the use of yam peels of Abi and Pepa yam varieties of 5, 10, 15, and 30-40 mm thickness, for seed yam production. Pepa had poorer crop establishment and produced fewer but larger tubers than Abi. The 10 mm-thick peels were comparable to the 15 and 30-40 mm-thick setts, but better than the 5 mm-thick peels in number (24,938 tubers/ha), total yield (6.2t/ha) and mean weight (261.1 g) of seeds yams. This makes the 10 mm-thick peels the optimum sett thickness for seed yam production. The distribution of seed yams into various weight categories is given. Yam peels could thus be used for seed yam production, while more of the storage parenchyma is used as food.

Key words: seed yams, production, *Dioscorea rotundata*, yam peels, sett thickness

Pages 31-34

Demographic, agricultural and technological profiles of Nigerian yam (Dioscorea spp.) farmers

I.N. Itodo & J.O. Daudu

ABSTRACT

The demographic, agricultural and technological profiles of Nigerian yam farmers were determined by use of questionnaires. The mechanization of yam production cannot be easily achieved without proper knowledge of the users of the various technologies being developed or adapted. The demographic characteristics of the farmers determined include age, educational status and size and sex distribution of households. The agricultural profile of the farmers determined include farming status, type of farming, type of tuber crop cultivated, reasons for growing yams, species of yam grown and factors influencing the choice of variety grown. Technological issues considered were sources and availability of labour including human labour, labour distribution by type of farming operation, tools used on the farm and assess to use of tractor. The survey showed that the source of labour on the farm is completely manual. On the basis and time spent, mounding, harvesting and weeding were the most demanding operations with preference for mechanizing them topping the desire of the farmers. Almost all the farmers have no access to a tractor. Therefore, the mechanization of yam production must start from the application of simple, motorized technologies.

Key words: yam farmers, profile, mechanization

Pages 35-38

Provisional constant for predicting viability of yam (*Dioscorea rotundata* Poir.) seeds under simulated tropical storage conditions

I.O. Daniel

ABSTRACT

The viability of white yam (*D. rotundata* Poir. cv Obiaoyurugo) seeds kept at 9 combinations of temperature and seed moisture content was checked by germination tests for 13 months in an attempt to model seed deterioration in storage and estimate seed viability constants. Seeds were dried to 2.9, 6.6 and 14.3% moisture content and stored under 15, 25 and 35°C. Seed survival under each storage treatment combination was evaluated by probit analysis and the relationship between seed survival and storage environment was evaluated by linear regression modeling to determine seed viability constant for white yam. Estimates of viability constants from the linear equation were K_L=3.904, C_1=-0.888 and C_2=-0.026. With these constants, it will be possible to predict percentage viability of yam seeds, but its validity applies only to constant storage conditions within the experimental conditions. An example is given.

Key words: yam, germplasm conservation, seed longevity modelling

Pages 38-41

Quality of starch from six Japanese sweetpotato varieties in Ghana

W.O. Ellis, I. Oduro, J. Barimah & J.A. Otoo

ABSTRACT

The quality of starch from six Japanese sweetpotato varieties under study in Ghana were assessed relative to one local variety for their potential for commercial use. These varieties were Minamiyutaka, Kagane Sengan, Shiroyutaka, Hi, Satuma and Shirosatuma. The parameters monitored were starch yield, moisture, ash, pH, amylose content, swelling power, solubility, viscosity and water-binding capacity. The results showed that the starches gave good physicochemical properties indicative of good quality starch, with high potential for industrial use. The Shirosatuma variety gave the highest yield of starch (22.73%) and Shiroyutaka the lowest (18.22%). The range for moisture and ash was 9.22-12.23% and 0.26-0.43% respectively. pH of the samples was low with no significant variations.Shirosatuma had the lowest values for swelling power (15.73 g/g), solubility (6.43%), water binding capacity (51.44%) and viscosity while Shiroyutaka and Minamiyutaka had the greatest amylose content of 28.4% and 28.1% respectively.Hi had the highest water-binding capacity (78.02%) and viscosity at both 30°C (69.62 mPas) and 70°C (48.92 mPas). The starches showed potential for high paste stability on cooking with Shiroyutaka and Minamiyutaka having the potential to contribute to meanliness due to the high amylose content.

Key words: sweetpotato, starch, varieties, Japanese

Pages 41-46

Potential of indigenous water tubers of Nymphaea species for food security in Malawi

C.M. Chawanje

ABSTRACT

Different parts of the waterlily plant, *Nymphea* species, are used as food in different parts of the world. In Malawi the tubers of *N. petersiana* which grows in swamps and pools along the lower Shire River valley are eaten and serve as an important source of food security during periods of famine. Data from the chemical analysis of the flour made from tubers on *N. petersiana* show that the tubers are a better source of nutrients (amino acids and the minerals calcium, phosphorus, zinc and iron) than commonly eaten cereals and tuber crops in Malawi.

Key words: food security, *Nymphea petersiana*, nyika, waterlily, tuber.

Pages 47-51

The cassava root mealybug (Stictococcus vayssierei Richard) [Hom: Stictococcidae]: present status and future priorities in Cameroon

J.M. Ngeve

ABSTRACT

A root mealybug of cassava (*Manihot esculenta* Crantz), identified as *Stictococcu*s *vayssierei*, was studied for 7 years in Cameroon. It is a Homopteran with incomplete metamorphosis. The male is rare. The female is more common, and is dark-red in colour, circular and flattened, and lays egg protected in wax threads secreted beneath its body; the eggs develop into cream-white larvae which grow up to adults. No pupal stage is present. The larvae and adults attack young feeder roots of germinating cuttings, causing extensive leaf-fall, wilting, tip dieback and death of plants. Plants that escape early infestation, develop normally and tuberize, but the mature tuberous roots are small and become covered with root scale, making them unattractive to market. In severe infestations, a mature tuberous root of about 40 cm long may harbour up to 500 mealybugs. The pest is rarely found in newly opened forest farms, nor is it prevalent in monocropped cassava plots. It is most severe during the dry season in lateritic and clayey soil, in fields of depleting fertility, and in thinly prepared land where planting has been done on the flat. The prevalence of the pest in the semi-humid forest region of Cameroon increased from 12.5% in 1990 to 87.5% in 1999.S. *vayssierei* infestation was more severe (30 mealybugs/hill) when cassava was planted on the flat than when planted on ridges (16 adults/hill). Plants also sprouted better (91%) when cassava was planted on ridges than when planted on the flat (71%). Root yields (31.4t/ha) and root numbers (7 roots /hill) were also higher in cassava planted on ridges than in those grown on the flat (24.6% and 4.5 roots/hill, respectively)) For plants grown on the flat, the improved clones suffered the least attack by *S.vayssierei* , clones 8017 and 8034 showing the most tolerance (19 and 22 females/hill, respectively)when compared with the local, Meyiboto (49 females /hill).S.*vayssierei* was more severe when cassava was intercropped; there were 40, 48 and 59 mealybug adults per hill when cassava was intercropped respectively with maize, groundnuts, or maize and groundnut combined. By contrast, maize suffered no yield depression when intercropped with cassava. S.*vayssierei* a major threat to cassava production in Cameroon and neighbouring Central African countries. It calls for emergency integrated control measures. With poorly enforced quarantine regulations, and the unrestricted movement of vegetative planting stakes from one country to the other in Africa, this pest is likely to become an epidemic if strong measures are not taken to

control its spread. There is a need to develop methods for rearing the insects in the laboratory for the production of large quantities of inoculum for uniform screening of newly developed varieties in the greenhouse before taking them to the field. Such screening tests would also permit the proper assessment of yield loss caused by the insect. Thirdly, although mixed cropping is widespread in Africa, and is practiced by farmers as an insurance against crop failure, it may be useful, at least until a sustainable control measure is sought, to recommend cassava monocropping in areas of heavy infestation, since it has been observed that the pest is less severe in monocropping situations. The effects of season, rainfall distribution and soil type on oviposition and insect development need to be further studied so as to determine whether it is the physical or chemical properties of the soil that play such differential role in pest prevalence and severity. Finally, the mechanism of cultivar tolerance to pest infestation could be studied to throw light on plant traits and cultural conditions that could be exploited in screening cassava clones for yield and pest tolerance. Such studies could lead to the early release of improved, mealybug-resistant varieties to growers. Orientations for future research are discussed.

Key words: root mealybug, root scale, cassava, Cameroon

Pages 52-55

The vegetative growth and yield response of two cassava clones to Glomus fasciculatum inoculation in semi-controlled conditions

O.J. Oyetunji, O. Osonubi & I.J. Ekanayake

ABSTRACT

The beneficial effects of arbuscular mycorrhizal (AM) fungus, Glomus fasciculatum on the vegetative growth and yield of improved cassava (*Manihot esculenta* Crantz) are not well described. Thus a semi-controlled experiment was carried out to evaluate the response of two improved cassava cultivars TMS 91934 and TMS 30572 to mycorrhizal inoculation. The experiment was arranged in a completely randomized design with three replications. The plants were either inoculated with G. fasciculatum (Thax. Sensu Gerd) or not. Genotypic differences were observed between two cultivars whether inoculated or not. The results showed both cultivars responded to the AM fungus; however TMS 30572 showed greater vegetative growth and yield response compared to TMS 91934. The cassava plants responded to mycorrhizal inoculation as early as 2-3 weeks after planting (leaf area of 9792.32 and 2252.20 cm^2/plant for inoculated and non-inoculated respectively). TMS 91934 consistently produced more leaves, leaf area, and number of stems. This study also revealed that TMS 91934 diverted its photoassimilates to the shoot for maintenance of aerial parts rather than to the storage roots, whereas TMS 30572 diverted its photoassimilates more to the tuberous roots instead of maintaining higher leaf area. This implies genetic variation exists between the two clones. It was concluded that due to positive growth and yield, use of AM fungus is beneficial for greater productivity of cassava.

Key words: *Glomus fasciculatum*, TMS 30572, TMS 91934, area, genotypic variation, photoassimilates, *Manihot esculenta* Crantz

Pages 56-59

Poverty alleviation through the processing of sweetpotato tubers toasted granules and consumer preferences in Nigeria

N.T. Meludu, C.G. Ajala & M.O.Akoroda

ABSTRACT

Sweetpotato is one of the food security crops that could contribute to alleviate poverty of many rural dwellers through improved processing techniques. Sweetpotato plays a major role as a famine reserve for many rural and urban households. This is because of its tolerance to drought, short growth period and high yield with limited inputs on relatively marginal soils. Sweetpotato is mainly consumed in Nigeria by boiling and roasting. Varied processing and utilization that will enhance the potentials of the crop in order to expand its marketing values are yet to be available for the farmers. The objective of this study was to evaluate the processing of sweetpotato varieties using the same process pathway for making gari in order to produce toasted sweetpotato granules (*spari*). Eleven sweetpotato varieties were selected for the study. Swelling capacity was estimated on sweetpotato product (*spari)* and compared with gari from cassava as the control. Sensory evaluation of sweetpotato toasted granules was conducted. The five-point scale of very acceptable, acceptable, indifferent, not acceptable and not very acceptable was used for tastiness, texture (crispy), after taste, flavour, and colour. A random survey of consumer preference was conducted on 62 respondents on general acceptability. The name *spari* (*sweet potato gari*) was coined out, to differentiate the new product from cassava gari. Agricultural Extension Agents should focus on improving this new product that reduce large tuber losses due to weevil, high water content, cost of transporting heavy tuber to light dry and storable product for rural poverty alleviation.

Key words: sweetpotato, processing, food security, Nigeria and *spari*