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Providing seed tubers for the production of food yams

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ABSTRACT

Seed tubers of yams (*Dioscorea* species) are the planting materials used in the field production of ware or table tubers consumed as food. The method traditionally used for providing seed tubers in current yam cultivation is inadequate to cope with the supply that farmers demand. In the late 1970s, a method was developed for the production of seed tubers separate from the production of ware, food or table tubers. The method now known as 'minisett technique' utilizes a small (20-50 g) part of a whole nondormant tuber containing periderm and some cortex parenchyma. The minisett is sown and the resulting tuber is sufficiently large to serve as a seed tuber that is suitable for the production of food tubers. Many aspects of the culture, physiology, socioeconomics as well as trends in its adoption have been studied especially in Nigeria by terms of researchers working at the National Root Crops Research Institute, Umudike and at the International Institute of Tropical Agriculture, Ibadan. At present (1995), the minisett technique is gaining acceptance among farmers through promotion and extension by agencies of government and non-governmental organizations as they seek to provide more seed tubers for greater field production of ware tubers for human food from yams in Africa.

Key words: seed tuber, ware tuber, table tuber, food tuber, yams, *Dioscorea* species

Pages 6-10

Yield response of edible yam (*Dioscorea* spp.) to time of fertilizer application and age at

harvest in an Ultisol in the humid zone of southeastern Nigeria

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ABSTRACT

Experiment were conducted to appraise the response of six cultivars of edible yam to fertilizer application during certain stages of growth and to evaluate the effect of varying age at harvest on their tuber yield. The test cultivars were Obiaoturugo and Nwopoko (*D. rotundata*), Abi (*D. rotundata-cayenensis* type), UM 680 and Ominelu (*D. alata*) and a *D. bulbifera*, Adu-olode. These were arranged factorially on split-plots in a randomized complete block design replicated thrice. There were significant ($p \leq 0.05$) differences among cultivars in percent survival, tuber number, fresh weight yield and multiplication ratio. Timing of fertilizer application significantly ($p \leq 0.05$) increased tuber yield; 8 wk after sowing resulted in the highest tuber number and fresh weight of tubers. Harvest age also significantly ($P \leq 0.05$) affected the yield of tubers; the best harvest age being 6-7 months. The tuber multiplication ratio was a better and more reliable measure for tuber yield.

Key words: edible yam, *Dioscorea* species, timing fertilizer, harvest age, tuber yield, multiplication ratio.

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**Response of groundnut (*Arachis hypogaea* L.)
in sole crop and in intercrop with cassava**

***(Manihot esculenta* Crantz) to lime in an Ultisol in Bas-Zaire**

O.A. Osiname & T. Muamba

ABSTRACT

Field trials were carried out in M'Vuazi, Bas Zaire, to test the response of groundnuts (cv P43), planted sole or intercropped with cassava (cv Kinuani), to lime application. Groundnuts responded significantly to low rates of lime (250-500 kg ha⁻¹). Maximum cost: benefit ratio of 1:7 was obtained when 500 kg lime ha⁻¹ was applied. Whether it was planted sole or intercropped with cassava, critical soil Ca level for groundnuts was estimated at 0.6 cmol kg⁻¹. There was no cassava root yield response to the lime application at a soil Ca level of 0.11 cmol kg⁻¹. Lime application below 2000 kg ha⁻¹ did not significantly change the surface soil pH and did not affect the subsoil chemical properties. The main effects of lime on groundnuts were, therefore, to supply adequate Ca to: (1) produce maximum number of mature pods and (2) diminish the incidence of unfilled pods.

Key words: Cassava, *manihot esculenta*, groundnut, intercropping, lime

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Soil N, P, K and land-use efficiency under cassava/sweetpotato intercropping system in Tanzania

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ABSTRACT

Cassava (C) and sweet potato (S) are commonly grown in mixtures in Tanzania, but crop competition for soil nutrients limit their yields. This study examined the changes in soil nutrients, nutrient use and mixture productivity in C/S intercropping and assessed the mixture productivity at Ukiriguru, Mwanza, Tanzania in the 1989/90 and 1990/91 seasons. Local cassava variety Msitu Zanzibar and sweet potato variety SPN/O were used. Cassava was planted on ridges at 1 × 1 m (10000 plants/ha) under both sole and intercropped plots. Sweet potato at 33 333 plants/ha was planted on both sides of the ridge spaced at 0.6 m between plants in intercropped plots. At 5 months after planting (MAP), soil nutrients under C/S mixtures were reduced: nitrogen (N) by 55%, phosphorus (P) by 37%, and potassium (K) by 36%. Within the first 5 MAP, a large share of soil N and K was taken up under both C and S cropping systems, nutrient depletion followed the order C/S mixtures > sole S > sole C. Soil nutrient reduction under both sole intercropped C in the first 5 MAP was double the amount used between 5 and 12 MAP. In C/S mixtures, K was competed for, and S took double the amount taken up by C. Reduction in storage root yield due to intercropping was more in C (27%) than in S (10%). Yields increased by about 35% over sole crop when C and S were intercropped.

Key words: N, P, K, land-use efficiency, cassava, sweet potato, intercropping

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Effects of shading on growth and flowering behavior of four cassava (*Manihot esculenta* Crantz) genotypes

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ABSTRACT

Cassava cultivated in the forest zone, and particularly as an intercrop, receives a reduced radiation budget. A field experiment was conducted at Ubiaja in Edo State, southwestern

Nigeria representing the derived savanna (humid forest-moist savanna transition) agroecozone. The aim was to assess the effect of solar radiation on growth and flowering behavior of two local cassava genotypes, TME 1 (Antiota) and TME 2 (Odongbo), noted as shy flowering genotypes and two improved clones TMS 3055 and TMS 91934, noted as profusely flowering genotypes. The solar radiation input was reduced from 100% (full sunlight) to 60% and 40%, respectively, by shading the plants with palm fronds. Shading of cassava at 40% and 60% light delayed the time to first flowering by 20 and 5 days, respectively and also reduced the number of flowers produced per flowering event by 22% and 2%, respectively. Shading generally delayed flowering of these four genotypes. The shaded plant had higher total dry weight per plant than unshaded ones. Shading seems to promote the vegetative phase of the plant. Results however were inconclusive on the regulatory role of light budget on floral induction. Further studies are required to define the specific light requirements for floral induction in different flowering classes and genotypes of cassava.

Key words: floral induction, shy flowering, light, solar radiation, branching, flowering events

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Mycelial growth, sporulation and spore germination of virulent *Colletotrichum gloeosporioides f. sp. manihotis* isolates under selected growth conditions

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ABSTRACT

Thirty isolates of *Collectotrichum gloeosporioides f. sp. Manihotis* causal organism of cassava anthracnose disease (CAD) were collected from cankers on cassava stems in cassava-growing zones of Nigeria. Using a pathogenicity test, five virulent isolates (05FCN, 10FCN, 12FCN, 18FCN and 26FCN) were identified and subsequently used in

determining the effect of temperature, pH, light and growth medium on mycelial growth, sporulation and spore germination. Sporulation differed ($P \leq 0.05$) among the isolates as a function of temperature, maximal sporulation of the isolates occurred at 25°C and the optimal range was observed between 22-27°C. Irrespective of culture medium, pH significantly affected the radial growth, sporulation and spore germination of the isolates. A pH of 6-8 was generally found suitable for mycelial growth, sporulation and spore germination of the isolates though the maximum response for these parameters was attained at pH 7. Inoculation in continuous darkness was the best for both mycelial growth and sporulation. Mycelial growth, sporulation and spore germination were also dependent on growth medium. High mycelia growth and sporulation of the isolates were obtained with tomato-8-agar, Czapek-dox solution agar, potato dextrose agar and Martin's medium.

Key words: cassava, *Colletotrichum gloeosporioides*, cassava anthracnose disease

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Heat of respiration of yam tubers and its effect on heat load

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ABSTRACT

Parametric information was obtained for different initial storage temperatures which ranged from 15°C to 35°C. Results show that ambient temperature is independent of the period of storage and initial storage temperature, but rises with days and falls with nights. Storage temperature on the other hand increases with increase in both the period of storage and initial storage temperature. It increased from an initial storage temperature of 15°C to 32°C for a storage period of 120 h. Similarly, it increased from 20°C to 41°C; 25°C to 47°C; 30°C to 55°C and from 35°C to 60.5°C for the same storage period. The storage environment temperature was found to increase by 1°C with about 5% increase in the time of storage throughout the storage period of 120 h, and initial storage temperatures of between 15°C and 35°C. Heat of respiration increases generally with

increase in initial storage temperature. For an initial storage temperature of 15°C, the heat of respiration increased from 6.023 W/kg to an average of 12.48W/kg for the storage period. Also for 20°C, it increased from 9.409 W/kg to an average of 21.56 W/kg and from 12.478 W/kg to 36.37 W/kg; 18.346 W/kg to 57.996 W/kg; and to 24.95 W/kg to 83.46 W/kg for 25°C, 30°C and 35°C respectively. The heat of respiration accounts for 89%-100% of the heat of the storage structure especially if the tubers for storage are uninfected by mold and other microorganisms.

Key words: yam, tuber respiration, heat loss, tuber storage

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Crop irrigation water needs of sweetpotato (*Ipomoea batatas*)

G.O. Chukwu

ABSTRACT

Crop water needs of sweet potato (*Ipomoea batatas*) was estimated using the Blaney-Criddle method at the National Root Crops Research Institute, Umudike, Nigeria. An estimated crop water need of 530 mm season⁻¹ disaggregated into 75, 121.8, 189 and 144.6 mm month⁻¹ for November, December, January and February, respectively was established. Irrigation water need was 506 mm season⁻¹. These established depths of water are considered a good estimation of the water requirements of sweet potato for irrigation planning and scheduling in southeastern Nigeria.

Key words: sweet potato, irrigation, water need

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Yams in Nigeria: status and trends

M.O. Akoroda & S.K. Hahn

ABSTRACT

Yams are still important staples in Nigeria despite a weakening research support and many production constraints. A recent overview of the status of the crop shows that the demand is high but its production is most adversely affected by the short supply of seed tubers as well as by difficulties associated with the storage of harvested tubers. The challenges to researchers, farmers, marketers and industrialists are more related to several postharvest issues of processing, tuber handling, transport, storage and the control of many pests and diseases in and out of the farm. However, much of the knowledge on the crop so far acquired through research have not been applied in farm practice due to poor transfer to or adoption by their ultimate users.

Key words: yams, *Dioscorea* spp., seed tuber, tuber storage

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Alleviating hunger in Africa with root and tuber crops

M.O. Akoroda

ABSTRACT

Data of the production of the major root crops show that the production of most African countries is low compared to their populations. It is proposed that increased productivity of these crops will not be the only way to cater for the worsening situation of food availability in the region.

Key words: Africa, hunger, calorie consumption, root and tuber crops