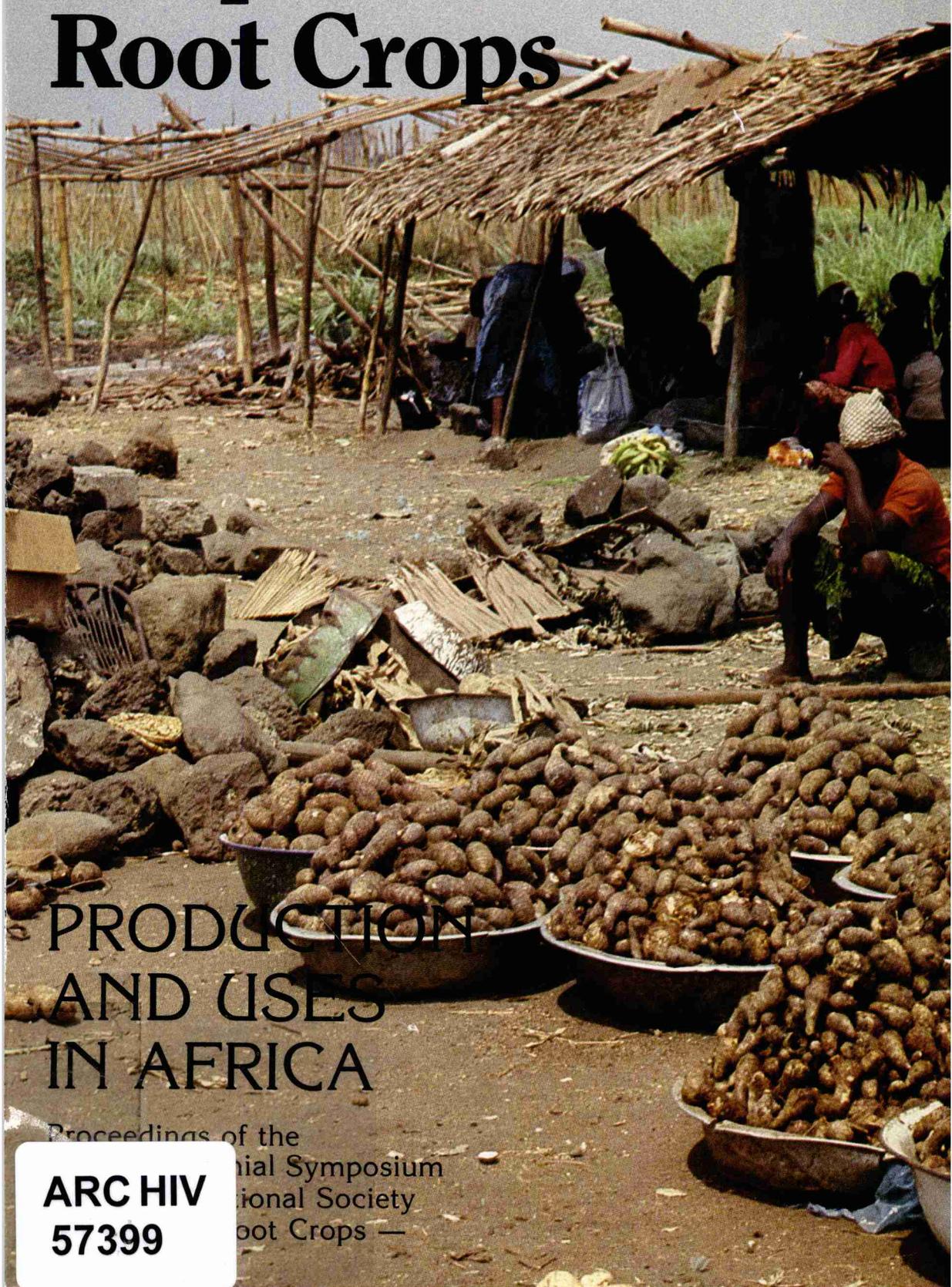


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Tropical Root Crops



PRODUCTION AND USES IN AFRICA

Proceedings of the
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Tropical Root Crops —

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The International Society for Tropical Root Crops — Africa Branch was created in 1978 to stimulate research, production, and utilization of root and tuber crops in Africa and the adjacent islands. The activities include encouragement of training and extension, organization of workshops and symposia, exchange of genetic materials, and facilitation of contacts between personnel working with root and tuber crops. The Society's headquarters are at the International Institute of Tropical Agriculture in Ibadan, Nigeria, but its executive council comprises eminent root and tuber researchers from national programs throughout the continent.

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ABSTRACT

A mixture of original research, updates on procedures, literature reviews, and survey reports, this document resulted from the second symposium of the International Society for Tropical Root Crops — Africa Branch, with 77 participants from 16 countries. The focus was cassava, yams, cocoyams, and sweet potatoes, from the perspectives of breeders, agronomists, soil specialists, plant pathologists, entomologists, nutritionists, food technologists, etc. Learning from past successes and failures, many of the researchers directed their efforts toward problems obstructing progress in reaching improved production and use of root crops and attempted to view, realistically, the context in which their results would be applied.

RÉSUMÉ

Résultats de recherches récentes, mises à jour sur les méthodes de recherche, revues de publications et rapports de sondages sont contenus dans ce document issu du Deuxième symposium de la Société internationale pour les plantes-racines tropicales — Direction Afrique, qui a réuni 77 participants de 16 pays. Des communications sur le manioc, le taro, le yam et la patate douce ont été présentées par des phytosélectionneurs, des agronomes, des pédologues, des phytopathologistes, des entomologistes et des spécialistes de la nutrition et des aliments, entre autres. Tirant leçon de leurs succès et de leurs échecs, beaucoup de ces chercheurs ont dirigé leurs efforts vers la solution des problèmes qui entravent l'augmentation de la production et de la consommation des plantes-racines et ont tenté de considérer d'un œil réaliste le contexte qui sera celui de l'application de leurs recherches.

RESUMEN

Una mezcla de investigaciones originales, actualizaciones de procedimientos, reseñas de literatura e informes de encuestas, este documento es el resultado del segundo simposio de la Sociedad Internacional de Raíces Tropicales, Filial Africana, que contó con 77 participantes de 16 países. El simposio se centró en la yuca, el ñame, el cocoñame y las batatas, desde la perspectiva de los fitomejoradores, los agrónomos, los especialistas en suelos, los patólogos vegetales, los entomólogos, los nutricionistas, los tecnólogos alimenticios, etc. A partir de los éxitos y fracasos anteriores, muchos de los investigadores encaminaron sus esfuerzos hacia los problemas que obstaculizan el avance para lograr una producción y un uso mejorados de las raíces y trataron de obtener una visión realista del contexto en que los resultados pueden ser aplicados.

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TROPICAL ROOT CROPS: **PRODUCTION AND USES IN AFRICA**

EDITORS: E.R. TERRY, E.V. DOKU, O.B. ARENE, AND N.M. MAHUNGU

*PROCEEDINGS OF THE SECOND TRIENNIAL SYMPOSIUM OF THE INTERNATIONAL
SOCIETY FOR TROPICAL ROOT CROPS — AFRICA BRANCH HELD IN DOUALA,
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CONTENTS

<i>Foreword</i>	9
<i>Participants</i>	11
<i>Official addresses</i>	
Opening address Nkaifon Perfura	15
Presidential address Bede N. Okigbo	16
Closing address Nkaifon Perfura	17
<i>Introduction</i>	
Production potentials of major tropical root and tuber crops E.V. Doku	19
Potential utilization of major root crops, with special emphasis on human, animal, and industrial uses D.G. Coursey	25
<i>Cassava</i>	
Genetic parameters of cassava N.M. Mahungu, H.R. Chheda, S.K. Hahn, and C.A. Fatokun	37
Evaluation of cassava clones for leaf production in Zaire N.B. Lutaladio	41
Cassava screening in Rwanda J. Mulindangabo	45
Effect of variety and planting time on the yield of cassava in Malawi R.F. Nembozanga Sauti	49
Response of cassava to fertilizers and town refuse under continuous cropping S.O. Odurukwe and U.I. Oji	51
Rapid multiplication of cassava by direct planting M.T. Dahniya and S.N. Kallon	53
Effects of shade, nitrogen, and potassium on cassava I.N. Kasele, S.K. Hahn, C.O. Oputa, and P.N. Vine	55
Weed interference in cassava-maize intercrop in the rain forest of Nigeria Ray P.A. Unamma and L.S.O. Ene	59
Crop performance in complex mixtures: melon and okra in cassava-maize mixture J.E.G. Ikeorgu, T.A.T. Wahua, and H.C. Ezumah	63
Soil-conserving techniques in cassava and yam production P.N. Vine, O.B. Ajayi, D.M. Mitchozounou, E.J. Hounkpatin, and T. Hounkpevi	67
Factors limiting cassava production among peasants in Lukangu, Zaire Kilumba Ndayi	71
Epidemiology of anthracnose in cassava C. Makambila	73

Cassava yield losses from brown leaf spot induced by <i>Cercosporidium henningsii</i> J.M. Teri, P.W. Mtakwa, and D. Mshana	79
Susceptibility of cassava to <i>Colletotrichum manihotis</i> Muimba-Kankolongo A., M.O. Adeniji, and E.R. Terry	82
<i>Botryodiplodia</i> stem rot of cassava and methods of selecting varieties for resistance G.W. Otim-Nape	86
Distribution and severity of cassava mosaic in the Congo R. Massala	89
The cassava mealybug front hypothesis: role of indigenous natural enemies K.M. Lema, R.D. Hennessey, and H.R. Herren	90
Comparative bioecology of two coccinellids, predators of the cassava mealybug, in the Congo G. Fabres and A. Kiyindou	93
Effects of fertilizer application on postembryonic development and reproduction of the cassava mealybug K.M. Lema and N.M. Mahungu	97
Functional response of <i>Amblyseius fustis</i> to increasing density of its prey <i>Mononychellus tanajoa</i> T.O. Ezulike and J.K.U. Emehute	99
Control of the cassava green mite in Uganda B. Odongo and G. W. Otim-Nape	101
Studies on the nutrient content of yellow-pigmented cassava O. Safo-Kantanka, P. Aboagye, S.A. Amartey, and J.H. Oldham .	103
Microbial breakdown of linamarin in fermenting cassava pulp M.A.N. Ejiofor and Nduka Okafor	105
Performance of a cassava peeling machine P.M. Nwokedi	108
An improved technique of processing cassava fufu Festus A. Numfor	111
Cassava-based diets for rabbits R.T. Fomunyam, A.A. Adegbola, and O.L. Oke	114
Effects of cassava meal on the hatchability of chicken eggs D.A. Ngoka, E.C. Chike, A.B. Awoniyi, T. Enyinnia, and S.O. Odurukwe	117
Yams	
In-vitro culture of <i>Dioscorea rotundata</i> embryos C.E.A. Okezie, F.I.O. Nwoke, and S.N.C. Okonkwo	121
Economic indices for clonal selection and breeding of yams O.O. Okoli, J.U. Nwokoye, and C.C. Udugwu	125
Seed-yam production M.N. Alvarez and S.K. Hahn	129
Natural antifungal compounds from the peel of yam tubers S.K. Ogundana, D.T. Coxon, and C. Dennis	133
Optimal time for fertilization of <i>Dioscorea rotundata</i> S.C.O. Nwinyi ..	136
Effects of staking on tuber yield of three cultivars of trifoliate yam S.N. Lyonga and J.T. Ambe	138
Effect of time of staking on the development of anthracnose disease of water yam A.O. Nwankiti and I.U. Ahiara	140
Thermodynamics applied to the storage of yam tubers Godson O. Osuji	143
Root-knot susceptibility of crops grown with yam in Nigeria U.G. Atu and R.O. Ogbuji	147
Effects of cover plants on root-knot nematode population U.G. Atu and R.O. Ogbuji	149
Survival of <i>Botryodiplodia theobromae</i> in yam tissues B.I. Aderiye and S.K. Ogundana	151

Variability in the chemical composition of yams grown in Cameroon T. Agbor Egbe and S. Treche	153
Mineral content of yam tubers: raw, boiled, and as flour A. Bell	157
Introduction of flour from <i>Dioscorea dumetorum</i> in a rural area G. Martin, S. Treche, L. Noubi, T. Agbor Egbe, and S. Gwangwa'a	161
<i>Cocoyams, Sweet Potatoes, and Others</i>	
In-vitro methods for cocoyam improvement E. Acheampong and G.G. Henshaw	165
Production of hybrid <i>Xanthosoma sagittifolium</i> and test for resistance to <i>Pythium myriotylum</i> A. Agueguia and S. Nzietchueng	169
Growth and development of <i>Colocasia</i> and <i>Xanthosoma</i> spp. under upland conditions M.C. Igbokwe	172
Effects of water-table depth on cocoyam B.S. Ghuman and R. Lal	175
Intercropping cocoyams with plantain: effects on the yield and disease of cocoyams M.C. Igbokwe, O.B. Arene, T.C. Ndubuizu, and E.E. Umana	182
Root rot of <i>Xanthosoma sagittifolium</i> caused by <i>Pythium myriotylum</i> in Cameroon Samuel Nzietchueng	185
Sweet-potato production potential in Rwanda G. Ndamage	189
Compartment studies with sweet potatoes in the highland zone of Cameroon S.N. Lyonga and J.A. Ayuk-Takem	192
Effects of vesicular-arbuscular mycorrhizae, temperature, and phosphorus on <i>Fusarium</i> wilt of sweet potato J.M. Ngeve and R.W. Roncadori	197
On-farm trials as a link between research and technology transfer H.J. Pfeiffer	203
Plantain in root-crop farming systems S.K. Karikari	206
References	209
<i>Abstracts</i>	
Yellow-pigmented cassava revisited K.A. Oduro	229
Distribution and utilization of cassava in Malawi R.F. Nembozanga Sauti	229
Can cassava productivity be raised in Zambia? N. Hrishi	230
Prospects for developing new white yam varieties M.O. Akoroda	230
Extension of root-crops technology to African farmers T. Enyinnia, H.E. Okereke, and D.A. Ngoka	231

RAPID MULTIPLICATION OF CASSAVA BY DIRECT PLANTING

N.T. DAHNIYA AND S.N. KALLON¹

The possibility of rapidly multiplying cassava by planting short, hardwood stakes and soft-stem tops into the field was investigated. The results suggest 1-, 2-, 3-, and 4-node hardwood stakes could be planted directly into the field under the wet, tropical conditions of Sierra Leone. Young stem tops could also be used, if two tops were planted per stand.

Cassava has a slow rate of propagation, only 10–30 times/year (Cock et al. 1976), but Wholey and Cock (1973) have shown that unligified shoot tips, when planted under mist, produce roots during the 2nd week and may be transplanted into the field after a further 10-day hardening. Kamalam et al. (1977) induced sprouting of stakes with as little as one-half node, but Lozano et al. (1977) reported that stakes with 1–3 nodes sprout poorly under field conditions because their size makes them susceptible to rapid dehydration. Stakes with more than 10 nodes have a better chance of surviving but mean more propagating material per unit area.

Within the past few years, several improved cassava clones with high yields and disease resistance have been released by research workers in Sierra Leone. The demand for planting material of these clones has exceeded supply because of the slow rate of crop multiplication and the enormous amount of planting material required for each stand. One way to reduce the latter is to plant shorter stakes, and this possibility is especially attractive in countries like Sierra Leone where rainfall is abundant.

MATERIALS AND METHODS

We investigated this possibility at the experimental farm of Njala University College, University of Sierra Leone, on upland, gravelly soil classified as Orthoxic Palehumult (Odell et al. 1974).

The experimental design was a randomized

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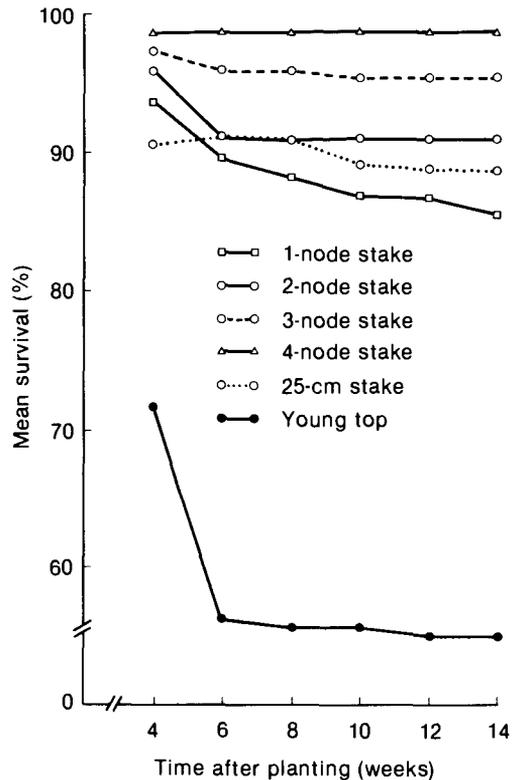


Fig. 1. Mean survival of cassava plants from five stake sizes and young tops.

complete block with six treatments and four replications. Each plot consisted of four ridges, each 5 m long, 1 m high, spaced 1 m apart. On 21 May 1980, 1-, 2-, 3-, and 4-node hardwood stakes, young stem tops, and hardwood stakes,

25 cm long, were planted 50 cm apart. The cassava variety was Nucass 1.

The single-node stakes averaged 4.3 cm long, and the 2-, 3-, and 4-node stakes were 7.3 cm, 10.8 cm, and 16.1 cm. The soft, young tops had an average diameter of 0.9 cm and were 15 cm long.

The 1-, 2-, 3-, and 4-node stakes were planted horizontally, the young tops vertically with about half their lengths underground, and the 25-cm hardwood stakes in an inclined position. Percentage sprouting was noted 4 weeks later, and, thereafter, survival, plant height, and number of stems were recorded fortnightly, with the two centre rows of each plot serving as sampling units. The plots that were entirely rainfed were weeded twice, 33 and 59 days after planting. No fertilizers were applied, and the study was terminated after 101 days.

RESULTS AND DISCUSSION

Sprouting reached 98.8% for the 4-node hardwood stakes, followed by 97.5% and 96.3% for the 2- and 3-node stakes, respectively. Sprouting was only 71.9% for the young tops, and survival was significantly lower than for the others (Fig. 1), decreasing to 55% at 14 weeks. These poor survival rates indicate how small the food reserves are for the young tops. In the horizontal plantings (4-node stakes), the buds would have been protected from rapid dehydration, whereas the upright young tops, with their high water content, would have been liable to rapid dehydration.

The heights of plants produced by the stakes directly related to the length of the original stakes, the 1-node stakes producing significantly shorter plants than the 25-cm, 4-, and 3-node stakes (Fig. 2).

Lozano et al. (1977) have reported that stakes with 1–3 nodes sprout poorly under field condi-

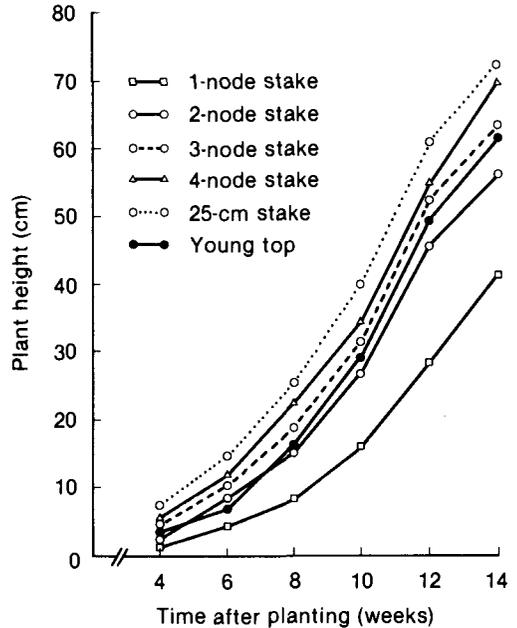


Fig. 2. Mean height of cassava plants derived from five different-sized stakes and young tops.

tions because their size makes them extremely susceptible to rapid dehydration. However, the present study demonstrates that there were no significant differences in the sprouting and survival percentages among the 25-cm, 4-, 3-, 2-, and 1-node stakes, which were in all cases higher than 90. This suggests that 1-, 2-, 3-, and 4-node stakes can be multiplied by direct field planting under the wet, tropical conditions of Sierra Leone.

Although Wholey and Cock (1973) reported that softwood stakes do not establish under field conditions, 55% of the young tops in this study survived at least 14 weeks. These findings indicate that young tops can be directly planted in the field, 2 plants/stand to offset poor survival.