

# Table of Contents

## SECTION 1. INVITATIONAL PAPERS AND GENERAL TOPICS

|  |    |
|--|----|
| Presidential Address: Tropical Root Crops in the Eighties<br>D.L. Plucknett  | 3  |
| Root Crops in Developing Countries - An Economic Appraisal<br>D. Horton, J. Lynam, and H. Knipscheer                           | 9  |
| Tropical Root Crop Statistics: A World Perspective<br>S. Chandra   | 41 |
| Developing Scientific Manpower for Root and Tuber Crops Research and Extension<br>C. Dominguez, F. Fernandez, and M. Piña, Jr. | 47 |
| Progress on Root and Tuber Improvement at IITA<br>S.K. Hahn  | 55 |
| The Disease Disposition of Tuber Crops as Compared to other Annual Crops<br>R. Delhey  | 59 |
| The Potential for Producing Root and Tuber Crops from Seed<br>P.M. Harris  | 67 |
| The Origins and History of the International Society for Tropical Root Crops<br>D.G. Coursey                                   | 81 |

## SECTION 2. AROIDS 89

|  |     |
|--|-----|
| AGRONOMY   | 89  |
| Herbicidal Weed Control in Tannia Cocoyam ( <u>Xanthosoma sagittifolium</u> )<br>L. Abasi and I.C. Onwueme | 91  |
| Water Use and Efficiency in Lowland Taro Production<br>R.S. de la Peña and F.M. Melchor                    | 97  |
| Effect of Some Intercrops on Taro<br>P. Sivan  | 103 |
| The Potential of Taro in Some South Pacific Islands<br>J.K. Wang, J.R. Carpenter, and R.S. de la Peña      | 109 |

BOTANY 115

Morphological and Anatomical Changes of the Keladi Cina (Colocasia esculenta)  
Plant in the Vegetative and Flowering Stages 115  
F.D. Ghani

Anatomy and Histochemistry of Taro Seed 121  
D.C. Scheirer and M.S. Strauss

Anatomy and Histochemistry of Taro, Colocasia esculenta (L.) Schott,  
Leaves 125  
B.D. Stein, M.S. Strauss, and D.C. Scheirer

Flowering Behavior in Colocasia gigantea Hook. f. (Abstract) 131  
B.P. Naiola, S. Danimihardja, and Hartati-Imamuddin

BREEDING 133

Salt Tolerant Tissue of Taro: Selection and Constituents 133  
L.P. Nyman, C.J. Gonzales, and J. Arditti

Breeding Strategies for Controlling Diseases of Taro in Solomon Islands 143  
M.Z. Patel, J. Saelea, and G.V.H. Jackson

Promotion of Flowering, Seed Production and Seedling Screening in Minor Edible  
Aroids 151  
J.E. Wilson and W.J. Cable

FOOD QUALITY AND CHEMICAL COMPOSITION 157

Evidence of Proteolytic Enzyme Activity in Taro, Colocasia esculenta (L.)  
Schott 157  
R.S. de la Peña and J.R. Pardales, Jr.

Starch Distribution in Cocoyam (Xanthosoma spp.) Corms and Cormels 161  
S.K. O'Hair, R.B. Volin, and M.P. Asokan

Variability in Taro, Colocasia esculenta Starches: Size, Gelation, and  
Amylose Content 165  
M.S. Strauss, and G.J.L. Griffin

Dry Matter Distribution and Root Proliferation in Taro (Abstract) 171  
M. Asghar and W.J. Cable

Studies on Coleus Starch (Abstract) 171  
S.N. Moorthy

PLANT PROTECTION 173

Studies on Root-Rot Disease of Cocoyam (Xanthosoma sagittifolium) in Cameroon caused by Pythium myriotylum. Some Aspects of Epidemiology and Control Measures 173

S. Nzietchueng

Rhabdovirus Infection of Taro, Colocasia esculenta (L.) Schott, from Papua New Guinea: Comparison of Symptomatic and Asymptomatic Material 181

M.S. Strauss

POSTHARVEST 187

Germination and Storage Behavior of Seed of Colocasia gigantea Hook. f. (Abstract) 187

J. Hanson and H. Imamuddin

PROPAGATION AND TISSUE CULTURE 189

Effect of Presence of the Terminal Bud, and Size and Type of Sectioning of the Corm on Propagation of New Cocoyam 189

J. Soto and J. Arze

SECTION 3. CASSAVA 197

AGRONOMY 197

The Potential of Cassava in Optimizing Small-Farm Productivity in Liberia 199

M. A-As-Saqui

Cassava Cultivators and their Cultivars. (Preliminary Results of Case Studies in the Sierra Region of the Dominican Republic) 205

L. Box

Community Organization Through Cassava Production: Towards a Mobilization of the South African Peasantry 213

P. Daphne

Yield Components as Influenced by Methods of Planting Cassava Cuttings 219

G.H. Godo

The Agronomy of Mukibat Cassava 225

B. Guritno, Sitompul, Soetono, and G.H. de Bruijn

Nitrogen and Potassium Responses of Two Cassava Varieties Grown on an Alfisol in Southern Nigeria 231

B.T. Kang and J.E. Okeke

- The Effects of Waste-Gas Flares on the Surrounding Cassava Plantations in the Niger Delta Regions of Nigeria 239  
A.O. Lawanson, A.M.A. Imevbore, and V.O. Fanimokun
- The Production of Planting Material in Cassava: Some Agronomic Implications 247  
D.E. Leihner
- Storage Effects on Planting Material and Subsequent Growth and Root Yield of Cassava (Manihot esculenta Crantz) 257  
D.E. Leihner
- The Effect of Gibberellic Acid and Gibberellin Inhibitors on Cassava 267  
R.J.M. Melis and J. van Staden
- Cassava Productivity in Intercropping Systems 277  
J.E. Okeke
- Effect of Stem Cut-Back on Yield and Yield Components of Intercropped Cassava 283  
P.S.O. Okoli and G.F. Wilson
- Performance in Association of Cultivars of Cassava (Manihot esculenta Crantz) and Cowpea (Vigna unguiculata Walp.) of Different Growth Habits 287  
W. Rodríguez, D.C. Kass, and P. Oñoro
- The Relationship between the Altitudinal Limit of Cassava and Soil Temperature in Papua New Guinea (Abstract) 295  
R.M. Bourke, J.P. Evenson, and B.A. Keating
- Field Nutrition Studies of Cassava (Abstract) 296  
L.N. Hicks, S. Fukai, and C.J. Asher
- Field Studies of Environmental Effects on Growth and Yield of Cassava (Abstract) 297  
F.R. Hobman and G.L. Hammer
- Studies with Cassava Planting Material (Abstract) 297  
B.A. Keating, G.L. Wilson, M. Partodidjojo, and J.P. Evenson
- Effects of Soil Moisture, Bulk Density, and Tillage Treatments on Tropical Root Crops (Abstract) 298  
R. Lal, B.S. Ghuman, and H.O. Maduakor
- Leaching Losses and Recovery of Fertilizer Nitrogen in Cassava/Maize Intercrop Grown in Lysimeters (Abstract) 298  
B.O. Njoku, M.C. Igbokwe, and A.C. Ohiri
- BREEDING 299
- Evaluation of Cassava for Leaf and Root Production in Sierra Leone 299  
M.T. Dahniya

Breeding Cassava for Adaptation to Stress Conditions: Development of a  
Methodology 303  
C.H. Hershey

A Comprehensive Breeding Approach to Pest and Disease Problems of  
Cassava 315  
J.C. Lozano, C.H. Hershey, A. Bellotti, and R. Zeigler

Cassava Germplasm in Australia (Abstract) 321  
B.A. Keating, J.P. Evenson, and S. Fukai

FOOD QUALITY AND CHEMICAL COMPOSITION 323

Changes in Cyanide Content of Cassava Tissues as Affected by Plant Age  
and Variety 323  
G. Gómez and M. Valdivieso

Processing and Detoxification of Cassava 329  
O.L. Oke

Cyanide Content of Cassava Cultivars in Relation to Nitrogen Fertilization  
(Abstract) 337  
G.O. Obigbesan

PLANT PROTECTION 339

Observations on Cassava Mealybugs in the Americas; their Biology, Ecology and  
Natural Enemies 339  
A.C. Bellotti, J.A. Reyes, and A.M. Varela

Serological Diagnostic of African Cassava Mosaic by Immuno-Enzymatic  
Method 353  
J.C. Thouvenel, D. Fargette, C. Fauquet, and A. Monsarrat

Investigations on the Biology and Ecology of Oligota minuta Cam.  
(Coleoptera: Staphylinidae) a Predator of Mononychellus tanajoa (Bondar)  
(Acari.: Tetranychidae) in the Neotropics 357  
M. Yaseen

A Summary of Recent Research on the Superelongation Disease of Cassava 363  
R.S. Zeigler, J.C. Lozano, and E. Alvarez

Electrophoretic Detection of Frog Skin-Infected Manihot esculenta  
(Abstract) 371  
U. Jayasinghe, A.C. Velasco, and J.C. Lozano

Investigations of Mononychellus tanajoa (Bondar) and the Cyanogenic Glucosides  
of Cassava Manihot esculenta Crantz (Abstract) 371  
I.C. Yen, F. Ali, and M. Yaseen

POSTHARVEST 373

The Development of a Through Circulation Solar Heated Air Drier for Cassava Chips 373

R. Best, L. Alonso, and C. Vélez

Cassava Storage Root Yield Losses from Root-Knot Nematode (Meloidogyne incognita and M. javanica) Parasitism 381

F.E. Caveness

Effect of Whole-Root Chips Loading for Drying Cassava on Trays or Concrete Floor on Cyanide Losses 387

G. Gómez and M. Valdivieso

Least-Cost Rations Containing Cassava Meal for Broilers and Growing Pigs 393

G. Gómez, J. Santos, and M. Valdivieso

Cassava Root and Foliage Meals in Laying Hen Diets 401

J.J. Montilla

Cassava for Food or Fuel? 411

T.P. Phillips

Pre-Harvest Environmental Effects on Cassava Root Susceptibility to Post-Harvest Physiological Deterioration 419

C.C. Wheatley, J.C. Lozano, J. Marriott, and W.W. Schwabe

Developing Cassava as an Industrial Crop in Australia (Abstract) 431

N.V. Harris and L.M. Doggrell

Fuel Ethanol from Cassava: The Baiyer River Experience (Abstract) 431

E.B. Holmes and K. Newcombe

Natural Drying of Cassava for Animal Feed - The Establishment of Small-Scale Agroindustries on the North Coast of Colombia (Abstract) 432

B. Ospina, R. Best, and G. Gomez

PROPAGATION AND TISSUE CULTURE 433

Effect of Cutting Quality on Cassava 433

J.C. Lozano, B. Pineda, and U. Jayasinghe

Effect of Various Factors on Minimal Growth in Tissue Culture Storage of Cassava Germplasm 441

W.M. Roca, R. Reyes, and J. Beltrán

The Potential of Tissue Culture in Cassava Improvement (Abstract) 447

D.H. Byrne and M. Cappadocia

SECTION 4. POTATO 449

AGRONOMY 449

Potato Production in Fiji - Potentials and Constraints 451  
M. Iqbal

Improving Adaptation of the Potato (Solanum spp.) to Hot Climates - Some  
Physiological Considerations 457  
D.J. Midmore and H.A. Mendoza

Physiological Aspects of the Adaptation of the Potato to the Hot Humid  
Tropics 465  
B. Sattelmacher

Seed Tuber Potato Production in Argentina (Abstract) 471  
D.O. Caldiz

Potato Performance in Soil Families of the Benchmark Soils Project  
(Abstract) 471  
L.A. Manrique

BREEDING 473

Estimation of Outcrossing Rates in Andigena Cultivars: Implications in  
Breeding TPS Cultivars 473  
C.R. Brown and Z. Huamán

Potato Breeding for Combined Resistance to Tropical Pests by the Ploidy Level  
Manipulation Approach: Progress in Extraction of Haploids with Male Fertility  
and 2n Pollen 481  
M. Iwanaga

Intervarietal Hybridization for Potato Production from True Potato Seed  
(TPS) 487  
H.M. Kidane-Mariam, H.A. Mendoza, and R.O. Wissar

Preliminary Evaluation of True Potato Seed Progenies for their Resistance  
to Phytophthora infestans (Mont de Bary), Productivity and Uniformity  
in Colombia 493  
O. Pérez, R.N. Estrada, J.L. Zapata, O.S. Malamud, and J.P. Malagamba

FOOD QUALITY AND CHEMICAL COMPOSITION 499

Dry Matter Content, Total Protein and Consumer Acceptability of Potatoes  
(Solanum spp.) Produced Under Hot Tropical Conditions 499  
N. Espinola, D.J. Midmore, and S. Poats

PLANT PROTECTION 509

Integrated Control of Potato Moth in Rustic Potato Stores 509  
K.V. Raman and R.H. Booth

Control of Potato Tubermoth (Phthorimaea operculella) Through Crop  
Association 517  
S.A. Raymundo and J. Alcazar

Interaction of Phosphate Fertilizer and Cyst Nematode Infestation (Globodera  
pallida), in Two Potato Cultivars 523  
M. Villagarcía and J. Franco

Diseases and Pests of the Potato in Sri Lanka: 1975-1982 (Abstract) 529  
M. Velupillai and E.R. French

PROPAGATION AND TISSUE CULTURE 531

Tissue Culture and Seed Potato Production in Vietnam (Abstract) 531  
Nguyen Van Uyen

SECTION 5. SWEET POTATO 533

AGRONOMY 533

Fertilizer N Use Efficiency and Associative N<sub>2</sub>-Fixation of Sweet  
Potato 535  
W.A. Hill and P. Bacon

Genotype by Environment Interactions of the Yield Components in Sweet  
Potato 543  
M.J.J. Janssens

Sweet Potato Seed Improvement on the Farm 553  
L.G. Wilson and W. Collins

Effect of Depth of Planting on the Development and Yield of Sweet Potato Using  
Different Types of Cuttings (Abstract) 559  
L. Chiappe, E. Wieland, and M. Villagarcía

BOTANY 561

The Ipomoea trifida Complex Closely Related to Sweet Potato 561  
M. Kobayashi

A Clustering Technique for the Classification of Sweet Potato Incompatibility  
Groups (Abstract) 569  
J.C. Bouwkamp and A.J. Unertl



BREEDING 571

Progress in Developing Sweet Potato (Ipomoea batatas (L.) Lam.) Cultivars for Fuel Alcohol Production 571  
W.W. Collins

FOOD QUALITY AND QUEMICAL COMPOSITION 577

A Comparison of the Volatile Constituents and Sugars of Representative Asian, Central American, and North American Sweet Potatoes 577  
S.J. Kays and R.J. Horvat

Effect of Time of Harvest on Five Sweet Potato Varieties in Root and Flour Yield and Bread-Making (Abstract) 587  
L. Chiappe, H. De la Cruz, R. Zarate, and M. Villagarcia

Yield and Flour Production of Twelve White, Sweet Potato Cultivars for Industrial Use (Abstract) 587  
L. Chiappe, P.E. Lopez, and M. Villagarcia

PLANT PROTECTION 589

Technique for Evaluating Resistance of Sweet Potato Accessions to the Weevil, Cylas formicarius elengantulus Fabr. (Abstract) 589  
E.N. Bernardo and N.M. Esguerra

Effect of Type in Histological Differentiation, Precocity, Production, and Susceptibility to Nematodes in Sweet Potato (Abstract) 589  
C. Lopez Ocaña and R.E. Ortiz

SECTION 6. YAM 591

AGRONOMY 591

Preliminary Research on Timing of Weed Control in Yams (Dioscorea rotundata Poir) and Taniers (Xanthosoma sp.) 593  
A.J. Beale

Dioscorea nummularia Lam.: The Primary Edible Yam of Western Samoa 599  
W.J. Cable and J.E. Wilson

Yam (Dioscorea spp.) Management for Control of Tuber Decay 607  
J.S. Mignucci, C. de Kok, M. Santiago, J. Green, P.R. Hepperly,  
H. Vélez, and R. Torres-López

Experiments on the Vegetative Cycle and Yield Variation of Dioscorea alata by Successive Monthly Plantings and One-Year Aged Seed Tuber Planting (Abstract) 615  
R. Arnolin and P. Mathurin

- Studies on Fertilization of Yam (Dioscorea spp.) and Yam Tuber Storage in Cameroon (Abstract) 616  
S.N. Lyonga
- Studies on Yam/Maize Intercropping (Abstract) 617  
S.O. Odurukwe
- Soil Physical and Chemical Properties Suitable for Yam (Dioscorea rotundata) Production in Southeastern Nigeria (Abstract) 618  
A.C. Ohiri and J.U. Nwokoye
- Guinea Negro: A High Yielding Out of Season Yam Cultivar (Abstract) 618  
O.D. Ramirez, J.J. Green, and I. Caloni
- FOOD QUALITY AND CHEMICAL COMPOSITION 619
- Natural Antifungal Compounds from the Peel of Yam Tubers 619  
S.K. Ogundana, D.T. Coxon, and C. Dennis
- Phytate Content in Yam, Cooked Yam, and Yam Flour (Abstract) 625  
A. Bell
- Changes in the Nutritive Value of Two Yam Species (Dioscorea dumetorum and D. rotundata) during Growth and Storage of the Tubers (Abstract) 626  
S. Treche
- PLANT PROTECTION 627
- Selection of D. alata Cultivars of Low Susceptibility to Anthracnose (Colletotrichum gloeosporioides) 627  
L. Degras, R. Arnolin, C. Suard, and R. Poitout
- Advances in the Study of Anthracnose/Blotch Disease of Dioscorea alata in Nigeria 633  
A.O. Nwankiti and L.S.O. Ene
- PROPAGATION AND TISSUE CULTURE 641
- In vitro Culture, Results and Prospects for Food Yams 641  
R. Arnolin and L. Degras
- The Effect of Sett Size, Sett Type and Spacing on Some Aspects of Growth, Development and Yield in White Lisbon Yams (D. alata L.) 649  
T.U. Ferguson, P.H. Haynes, and J.A. Spence
- Recent Approaches to Seed Yam Production 657  
C. Oyolu
- Contribution to the Study of Vegetative Reproduction of Yam: Plant Weaning and Tuber Pricking with Dioscorea alata (Abstract) 661  
P. Mathurin

SECTION 7. LIST OF PARTICIPANTS 663

WORLDWIDE 665

CIP 671



