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The Hunt Institute for Botanical Documentation, a research division of Carnegie Mellon University, specializes in the history of botany and all aspects of plant science and serves the international scientific community through research and documentation. To this end, the Institute acquires and maintains authoritative collections of books, plant images, manuscripts, portraits and data files, and provides publications and other modes of information service. The Institute meets the reference needs of botanists, biologists, historians, conservationists, librarians, bibliographers and the public at large, especially those concerned with any aspect of the North American flora.

Hunt Institute was dedicated in 1961 as the Rachel McMasters Miller Hunt Botanical Library, an international center for bibliographical research and service in the interests of botany and horticulture, as well as a center for the study of all aspects of the history of the plant sciences. By 1971 the Library's activities had so diversified that the name was changed to Hunt Institute for Botanical Documentation. Growth in collections and research projects led to the establishment of four programmatic departments: Archives, Art, Bibliography and the Library.

Trinidad Guardian, Tues, Apr. 4, 1967

MINISTER LAUDS SCIENTISTS AT UWI SYMPOSIUM

MR. LIONEL ROBINSON, Minister of Agriculture made his second appearance within fifteen hours before a body of international research scientists meeting at the University of the West Indies in the First International Symposium on Tropical Root Crops yesterday morning when he declared open the technical session.

The Minister told the agricultural scientists "the solution for a significant proportion of our problems in the West Indies and in the developing countries around the world rests with people trained in your disciplines and possessing your skills."

Mr. Robinson drew attention to the fact that the symposium and the Agricultural Economics Conference which follows on its heels are both based "on severely practical issues and problems which confront the West Indian farmer."

He referred to the Crown Lands Programme of the Trinidad and Tobago Government, stating "we have fixed targets for the establishment of over 900 food crop and vegetable farms by 1970, concluding that "our interest in the proceedings here is more than assured."

Mr. Robinson said that Trinidad and Tobago is proud to be host country to so distinguished a body of agricultural scientists.

Following the address by the Minister of Agriculture, papers were presented by Dr. Franklin D. Martin of the United States Department of Agriculture in Puerto Rico, Dr. D. B. Williams and Dr. F. W. Cope of the University of the West Indies, Dr. Teme Hernandez of Louisiana State University, U.S.A., Dr. Douglas E. Yen of Hawaii, Dr. David J. Rogers of Colorado State University and Professor G. Bolhuis of the Netherlands.

MR. LIONEL ROBINSON

Among other members of the symposium who spoke later in the day were Dr. L. Magoon of Kerala, India, Dr. B. C. Kundu of Calcutta, Dr. A. S. MacDonald of Uganda, and Dr. W. Royes of the University of the West Indies.

Many of the papers deal with breeding and improvement of the sweet potato and research on the cassava.

The symposium will re-convene this morning at 8.30 o'clock at the New Biology Building, St. Augustine.

Sunday Guardian

Port-of-Spain, Trinidad and Tobago 50th Year

No. 15236 ★★ April 2, 1967

PRICES
Trinidad & Tobago 15c.
Barbados, Grenada, St. Lucia and St. Vincent: 20¢
Other West Indian Islands and Guyana: 25¢

TIDES
High: 10.37 a.m. 4.35 p.m.
Low: ——— 6.16 p.m.
Sunrise: 6.02 a.m. Sunset: 6.15 p.m.

ET MEETING

World top scientists gather in Trinidad

MORE than 100 top ranking scientists in the field of agricultural sciences from leading institutions and universities from all over the world are in Trinidad to attend the first International Symposium On Tropical Roots Crops, which will be opened this afternoon at the Faculty of Agriculture at the University of the West Indies.

The symposium will be opened by the Minister of Agriculture, Mr. Lionel Robinson, and will convene on Monday morning at the biology conference room at St. Augustine for sessions until April 8.

The delegates for the symposium, who came in on Friday and yesterday, are from Canada, England, the United States of America, the British Solomon Islands, Africa, Hawaii, the Philippines, Holland, India, Japan, Venezuela, Central America, South America, Puerto Rico, the French West Indies, and the Commonwealth Caribbean territories.

Coinciding with the symposium will be the second West Indies Agricultural Economics Conference, organised by the Department of Economics and Farm Management of the Agricultural Faculty, which will take place from April 6 to 12.

MR. M. SINANAN, Q.C.

Combined session

The symposium and conference will work together in a number of sessions, and a combined session on the Economics of Root Crop Production is listed to take place from April 7 to 9.

While the symposium will deal with the technical aspects of root crop production, genetics and breeding, nutrition, agronomy, crop protection from pests and disease, storage and processing, the conference will be concerned with the economics of root crop production, including the banana industry, land use planning and policy, and the social aspects of agricultural development.

The experts in the field of crop sciences are expected to present a number of papers at both the symposium and the conference, while the special papers on the science of root crops and agricultural economics will be presented by scientists from the Faculty of Agriculture at the University of the West Indies, St. Augustine.

Sunday Guardian
Port-of-Spain, Trinidad & Tobago. 49th Year April 2, 1967.

AGRICULTURE & FARM EDITION

PUBLISHED IN HONOUR OF THE

FIRST INTERNATIONAL SYMPOSIUM ON TROPICAL ROOT CROPS

AND THE

SECOND AGRICULTURAL ECONOMICS CONFERENCE

TO BE HELD AT THE
UNIVERSITY OF THE WEST INDIES
from 2-12 APRIL '67

East St. George farmers are among the most progressive root crop farmers in Trinidad and Tobago. This Guardian newsphoto shows a 180-lb Lisbon yam which was reaped recently.

RECENT DEVELOPMENTS IN THE MANUFACTURE OF STARCH FROM CASSAVA ROOTS IN UGANDA.

DR. B.N. GHOSH.

B.Sc. (Agr. E.), Ph.D. (Agr. E.), A.M.I. Mech. E.
A.M.I. Agr. E., Mem. A.S.A.E.

DIVISION OF AGRICULTURAL ENGINEERING,
MAKERERE UNIVERSITY COLLEGE,
P.O.BOX 262,
KAMPALA,
UGANDA.

(A paper prepared for presentation at the International Symposium on Tropical Root Crops, University of the West Indies, St. Augustine, Trinidad, 2nd-8th April 1967, as a contribution from the University of East Africa).

TROPICAL ROOT CROPS

- A select bibliography -

Prepared on the occasion of
the Tropical Root Crops
Symposium, April 2 - April 9,
1967.

SUGGESTIONS FOR THE ORGANIZATION OF FUTURE WORK ON TROPICAL ROOT CROPS

This Symposium has highlighted the great lack of existing information on tropical root crops. The crops may be placed in the following order:-

Sweet potato - Most information

Cassava (manioc)

Yams

Aroids

Minor Root crops - Least information

Although the Symposium has been most useful in bringing attention to the problems of these crops and in bringing workers together, its ultimate usefulness would be greatly enhanced if its functions could be extended into some permanent body. It is proposed therefore that some form of International Standing Committee in Tropical Root Crops be set up.

This I.S.C.T.R.C. would have the following functions:-

(a) Preparation and issue of Proceedings (though arrangements for this are already, doubtless, in hand)

(b) Organization of future Symposia.

(c) The creation of a Tropical Root Crops Information Centre. This work could grow out of the Bibliography currently under preparation by Dr. Montaldo - see Appendix A.

(d) Investigate the possibility of establishing an International Root Crops Research Institute (comparable with the existing Rice Research Institute in the Philippines) - see Appendix B.

THE ECONOMIC ASPECTS OF THE PACIFIC SWEET POTATO COLLECTION

by

D. E. Yen
Bernice P. Bishop Museum
Honolulu, Hawaii

The collection of sweet potato varieties from the Pacific Islands was begun in 1957 with its objective being mainly ethnological in interest (Yen, 1963a). The plant, Ipomoea batatas (L.) Lam., first identified specifically by the botanists with James Cook has offered an enigma in the generally topic of the peopling of the Pacific, for the debated American origin assigned to the plant forced the recognition of the possibility of prehistoric contacts with the New World (Dixon, 1932). The scope of collection was extended to America and Asia in the light of the unsettled issue of origin, since the evidence of Vavilov (1931: 1949/50) for South American or Mexican provenance has not been defined. The live collection, grown in New Zealand as it was gradually accumulated from successive field trips, demonstrated the comparative variability of varietal populations from the broad geographical areas, and indicated that the ultimate source of the Polynesian, Melanesian and Asian material was America. A report on the incomplete material (Yen, 1963b) showed that the area of provenance for the whole Pacific material could have been identified as South America.

The full collection of 580 varieties was grown for the final comparison in the 1963/1964 season. Cytological investigation

INTRA AND INTERSPECIFIC CROSSES IN THE GENUS MANIHOT

G.G. Bolhuis

Div. of Trop. Crop Husbandry, University of Wageningen

Introduction. As long as selection in cassava is limited to the testing of cultivars, seed production is not a factor of importance. It becomes, however, very important when in the case of breeding purposes large populations of seedlings are necessary either from free-pollinated plants or from artificially cross-pollinated plants. In the latter case, especially it is desirable that from hand operated pollinations are obtained as much fruits and from each fruit as much seeds as possible.

Koch (7) in his thesis does not pay much attention to this problem and gives only a few figures. He mentions that in 1933 from 22.000 cross pollinations in total 1500 fruits were obtained signifying a success of 7%. On the behavior of the various cultivars used as parent clones nothing is mentioned. More data are given by him on the crosses between Manihot utilissima and M. glaziovii, but here the number of pollinations is so small that expression in percentages may lead to erroneous conclusions. The same objections must be made in relation to figures given by Nichols (9). He notes that from his crosses between different cultivars the percentages of success fluctuate between 0 and 56, with averages of 13.6 and 14.6 which have relation to resp. 27 and 32 crosses in the F_1 and F_2 generations. Nothing is said, however, about the behaviour of the different parent clones. He concludes that a low percentage of success is a striking feature within the species. In those cases when he got no success at all he assumes that there may exist incompatibility.

R- has lenticels
S- no, or small lenticels.

PRELIMINARY WORK ON THE PROBLEM OF CLASSIFYING MANIOC VARIETIES

By Luis A. Montoya[1], Ernesto H. Cásseres[1], Guillermo Hernández[2], Raúl Mosqueda[2], Sergio Brambila[3], and Irma Tejada[3]

Classification of manioc has generally been limited to a distinction between "sweet" and "bitter" varieties. This common method of classification is based entirely on the taste of the roots (cortex or edible part) which in turn depends largely on the hydrocyanic acid (HCN) content. However, since the HCN content of a given plant fluctuates not only with the physiological stage of the plant but also with the region where it is cultivated, the differentiation between "sweet" and "bitter" varieties does not provide a sound basis for classifying manioc.

The problem of classifying the varieties and cultivars of manioc grown in the tropical and sub-tropical areas of Latin Ame-

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1 Inter-American Institute of Agricultural Science of the OAS - (Office in Mexico)
2 Instituto Nacional de Investigaciones Agrícolas, SAG, México.
3 Centro Nacional de Investigaciones Pecuarias, SAG, México.

CCC

2 chloroethyltrimethylammonium chloride

THE DEPENDENCE OF PHOTOSYNTHESIS ON CARBOHYDRATE SINKS:

CURRENT CONCEPTS

- by -

E. C. HUMPHRIES

Rothamsted Experimental Station, Harpenden, Herts.

CHEMICAL ASSAY OF THE ANTHOCYAN PIGMENTS IN SWEETPOTATO:-

A note by

C.E. Seaforth, University of the West Indies, Trinidad.

Only a very limited amount of information is available on the chemical composition of the sweetpotato, Ipomoea batatas(1). Its anthocyanin pigments have only recently been identified as acylated glycosides of cyanidin and peonidin(2), and some correlation studies have been carried out in connection with the syntheses of carotenoids and of anthocyanins in the stems and tuberous roots of the sweetpotato(3).

The breeding of sweetpotatoes at the University in Trinidad takes into account the need to eliminate a trait which produces purple mottles in the flesh of the tuberous roots. The pigments concerned are the sap soluble anthocyanins which, in comparison with the orange coloured carotenoids, have been little studied quantitatively in the sweetpotato. In quantitative work, any visual assessment of colour intensity suffers from the defect known as the "human element." So only major differences in purple colour intensity are likely to be detected visually in the flesh of any group of freshly-cut tuberous roots, as in the sweetpotato, where the background may vary from cream to yellowish orange. Other significant errors are likely to arise in a method which replaces the human eye with a colorimeter, like the Hunter colorimeter(4), to measure directly the intensity of the purple flecks at a surface.

In this communication, a more objective method is described for routinely assessing the purple pigment concentration in the flesh of sweetpotato tuberous roots. The method proposed should help the geneticist to follow the occurrence of the previously mentioned undesirable trait in the sweetpotato. The method requires a photoelectric colorimeter to determine the intensity of purple colour in a standard solution extract of the plant tissue. A suitable colorimeter using an Ilford spectrum filter is the EEL Portable Colorimeter (manufactured to give an accuracy of about two percent by Evans Electroselenium Ltd., Essex, England).

PLANT NUTRIENT DEFICIENCIES AND RELATED TISSUE COMPOSITION OF TANNIA (XANTHOSOMA SAGGITIFOLIUM)

by

J. A. Spence and N. Ahmad

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INTRODUCTION

Deficiency symptoms have been described for tropical plantation crops but for many important food crops such symptoms have yet to be described. A series of studies is now underway to produce and record the symptoms of deficiency of food crops of importance to the West Indies. The results of studies on Pigeon Pea (Gungo pea) Cajanus cajan (Nichols 1964) and Sweet potato Ipomoea batatas (Spence and Ahmad 1967) have already been published.

This paper deals with the symptoms produced by lack of the major plant nutrients: nitrogen, sulphur, phosphorus, calcium, potassium, magnesium and iron on tannia, Xanthosoma saggitifolium. The authors have not been able to find any previous record in the literature of deficiency symptoms in this crop.

MATERIALS AND METHODS

Culture technique

The sand culture technique used was modified from methods reported by Hewitt (1952) and was described in detail in a previous paper (Spence and Ahmad 1967).

It consisted essentially of a series of clay pots, 20 cm. in diameter, coated inside with bituminous paint and filled with acid washed (10% hydrochloric

THE RESPONSE OF TARO (COLOCASIA ESCULENTA [L.] SCHOTT) TO N, P, AND K FERTILIZATION UNDER UPLAND AND LOWLAND CONDITIONS IN HAWAII

Ramon S. de la Pena and Donald L. Plucknett

Taro is one of man's oldest food crops. Records of taro cultivation date back to 400 B.C. It is widely used throughout the tropic, sub-tropic and sub-temperate zones as a vegetable or a starch source. It is used for food either as boiled, diced cubes or as "poi", a paste made from boiled, mashed corms allowed to ferment a day or more. It is also sliced and baked or made into taro chips. Dieticians have long recognized the unique properties of poi as a baby food (Derstine and Rada, 1952; Miller, 1927, 1929; Miller, Bauer and Denning, 1952). Clinical studies conducted to determine the food properties of poi confirmed it values as food for normal, allergic, and potentially allergic babies (Glaser, Lawrence, Harrison and Ball, 1965).

Taro is of primary importance in the Pacific Basin because it is the staple food of most of the inhabitants. In most of Asia and Africa, it is used as a vegetable similar to potato or sweet potato. In the Hawaiian Islands it is still an economically important crop despite the rapidly declining acreage devoted to its production.

Despite its importance, little is known of the fertility and nutrient requirements of the taro plant. This research was designed to study the response of taro to relatively high rates of fertilization and to investigate the N, P, and K requirements of taro under upland and lowland conditions in Hawaii.

THE USE OF ROOTED LEAVES AND GRAFTED PLANTS FOR THE STUDY OF CARBOHYDRATE METABOLISM IN SWEET POTATO.

by

L.A. Wilson (Biochemist),

Ministry of Agriculture,

Central Experiment Station,

Centeno.

Introduction.

In a review of some of the physiological determinants of tuber yield in different sweet potato varieties, (Wilson 1967) it became evident that the direction of photosynthate to tubers was perhaps more important as a determinant of tuber yield than the total amount of dry matter produced by the plant. The direction of photosynthate to tubers, (organs of perennation) was considered to be an attribute of plant morphogenesis, as opposed to the photosynthetic attributes of the plant which were more related to total dry matter production. Final tuber yield was considered to be the end result of a series of morphogenetic changes associated with the direction of photosynthate to sinks connected with leaf production, leaf expansion, lateral bud development, decreasing specific leaf area and, at a certain critical point in the sweet potato life cycle, the tuber sink. The final balance established between the tuber sink and the several alternative leaf sinks at harvest time, is therefore, the ultimate determinant of yield in sweet potato species.

Three aspects of carbohydrate metabolism are involved in effecting these morphogenetic changes.

SOME PHYSIOLOGICAL PRINCIPLES DETERMINING THE YIELD OF ROOT CROPS

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Sutton Bonington, Loughborough, Leics.

I. INTRODUCTION

In this paper, the usual liberties taken by agriculturalists with botanical terminology will be accepted: the term 'root crops' will be used to denote all crops grown for some underground organ irrespective of its morphology. The adjective 'tropical' poses greater restrictions - mainly because most of the intimate aspects of the physiology and ecology of strictly tropical root crops are unknown. During the next decade there will surely be a vast extension of enquiry within this field - particularly concerning the description of responses to the main environmental factors and deeper understanding of the correlated functioning of species such as the sweet potato (Ipomoea batatas), cassava (Manihot esculenta) and yams (Dioscorea spp.). In the present context the most useful purpose may be served by examining relevant features of two species which are much more fully documented: one, the (Irish)potato (Solanum tuberosum) originated in the tropics, has been rigorously selected for growth in temperate climates, and is now finding its way back into the tropics; but for even mentioning the other, sugar beet (Beta vulgaris), the indulgence of the more ardent tropical agriculturalists must be sought.

A PRELIMINARY STUDY OF THE NUTRITIVE VALUE OF SOME DEHYDRATED TROPICAL ROOTS

By

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St. Augustine, Trinidad.

Root crops including cassava (Manihot esculenta); dasheen and eddoes (Colocasia esculenta); sweet potatoes (Ipomoea batatas) and yam (Dioscorea spp.) are commonly grown throughout the West Indies for food and contribute a major proportion of the total caloric intake (F.A.O. 1962). Despite their relative ease of propogation and high energy-yielding potential, research efforts on these crops has been negligible in comparison with that of the export crops, and cultivation has remained largely in the hands of peasant farmers (Campbell and Gooding 1962). Being highly perishable and of limited transportability, consumption is largely limited to domestic markets. Unlike other tropical countries where they constitute valuable sources of feed for all classes of livestock (Oyenuga 1955 and 1961) their use for this purpose in the West Indies is often associated with subsistence farming. The wastage and neglect which occurs needs little emphasis.

Recent investigations have demonstrated the possibilities for mechanical cultivation (Gooding and Campbell 1964; Chapman 1965) and the feasibility of commercial production (Haynes 1966) under Trinidad conditions. However little attention has been paid to problems involved in the transportation or utilization of these bulky high-carbohydrate, poor-protein foodstuffs. Although processing methods have long been developed (Martin and Leonard 1949, Holleman and Aten 1956), possibilities for the industrial utilization of roots for production of human and livestock food have hardly been explored here.

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