ANNOTATED BIBLIOGRAPHY OF TROPICAL ROOT AND TUBER CROPS

COMPILED BY: OGHENEKOME U. ONOKPISE
IBRAHIMA BAH
PETER HARTMANN
RUPERT GRANT SEALS

UNDER THE AUSPICES OF THE UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT PROJECT #631-0058 FOR THE CAMEROON ROOT AND TUBER RESEARCH PROJECT.
ANNOTATED BIBLIOGRAPHY OF
TROPICAL ROOT AND TUBER CROPS

YAMS
COCOYAMS
CASSAVA
SWEET POTATOES

A publication of the
Office of International Programs
College of Engineering Sciences, Technology & Agriculture
Florida Agricultural and Mechanical University
Tallahassee, Florida. 32307. U.S.A.

Under the auspices of the United States Agency
for International Development Project #631-0058
for the CAMEROON ROOTS AND TUBERS RESEARCH PROJECT

Compiled by: Oghenekome U. Onokpise,
Ibrahima Bah
Peter Hartmann
Rupert Grant Seals

First Published: April, 1988
Yams, cocoyams, cassava and sweet potatoes dominate the agricultural production in the Cameroons. Post-harvest losses of these root and tuber crops are considered to be very significant and constitute one of the major factors in the subsistency of the farmers. An awareness of this problem resulted in the Tropical Root and Tuber Research Project (ROTREP) for the Cameroons under the auspices of the United States Agency for International Development (USAID). This project is a collaborative effort involving three Historically Black Land Grant Institutions: University of Maryland, Eastern Shores (UMES), Alabama A and M University (AAMU) and the Florida A and M University (FAMU) with UMES as the lead institution. Literature on root and tuber crops research is widely scattered in several publications or restricted to specialized areas of research, thereby creating reference difficulties for scientists seeking information on these tropical crops. Therefore, the objective of this bibliography is to provide a comprehensive informational source that will become a repository for research scientists and scholars working with or interested in yams, cocoyams, cassava and sweet potatoes in the tropics and elsewhere.

Materials for this bibliography were obtained through computer searches, direct literature review and telephone calls to several institutions within the United States known to have some research work or information on tropical root crops. Initially, index cards were used to obtain the necessary information which was then transferred onto an IBM PC for storage and processing. The bibliography contains titles, authors and publications in which the work can be found. Occasionally, an abstract is included especially in cases where the paper had been written in French and it was felt that the translation of the abstract will be very useful to the reader. There is a separate listing for yams, cocoyams, cassava and sweet potatoes and authors are listed alphabetically for each crop.

Much of the information presented in this issue deals mainly with post-harvest storage research on root and tubers. This is a reflection of the initial efforts of Florida A&M University in surveying the post-harvest storage problems of these crops in the Cameroons. As more titles are added in the future, other areas of roots and tubers research will be included for completeness.

We wish to acknowledge with many thanks the Post Harvest Institute, Colorado for their cooperation and information supplied for this issue of the bibliography. Thanks are also extended to the libraries of Florida A&M, and Florida State Universities respectively for the facilities used in many of the computer researches.
Please direct any comments, inquiries and requests for copies of the bibliography to:

Dr. Rupert Grant Seals, Director  
Office of International Programs  
C.E.S.T.A.  
Florida Agricultural and Mechanical University  
Tallahassee, Florida 32307  
Telephone: (904) 599-3562

<table>
<thead>
<tr>
<th>TABLE OF CONTENTS</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>YAM BIBLIOGRAPHY</td>
<td>4</td>
</tr>
<tr>
<td>COCOYAM BIBLIOGRAPHY</td>
<td>17</td>
</tr>
<tr>
<td>CASSAVA BIBLIOGRAPHY</td>
<td>25</td>
</tr>
<tr>
<td>SWEET POTATO BIBLIOGRAPHY</td>
<td>37</td>
</tr>
<tr>
<td>AUTHOR(S)</td>
<td>TITLE</td>
</tr>
<tr>
<td>-----------</td>
<td>-------</td>
</tr>
</tbody>
</table>
Conservative estimates would suggest that out of the more than 200 million tons of horticulture crops produced annually in the tropical world (25%) is lost between harvest and consumption.

The paper reviews the limited information that exists in this field. The importance of further attempts to quantify the various elements in loss is stressed, and some indications given of possible ways of reducing losses.

Coursey, D. G.

"The Magnitude & Origins of Storage Losses in Nigerian Yams."

Coursey, D. G.  "(Yams) Storage, Transport & Processing." Though West Africa is the primary focus, the chapter looks at yam practice world-wide: Storage practices, magnitudes of storage losses, factors responsible for storage losses, seed-yam storage, effects of inhibitor treatments, chilling damages, transport-yam flour and industrial processing. Also a good literature review is included.

Demeaux, M., Babacauh, K. D., Vivier, P. Problems poses par la conservation des ignames en cote d'Tirire et essais de techniques pour les resousbe. (Storage. Efficiency of Thiabendafole. Gamma irradiation controlled atmosphere).


Dina, S. O. (National Cereals Research Institute, Moor Plantation, Ibadan.): Occurrence of Dasyses Rugosella Stainton (Lepidoptera: Tineidae) on Stored Yam Tubers in Nigeria.


Different means of storage are considered (field gene banks, seed gene banks, in vitro gene banks). Their combinations are deemed necessary for proper conservation and the fulfilling of various needs for research & production. The list of the major Dioscorea species (13 species for food and 7 for medicine) is provided with their common names, centers of origins, areas of cultivation, seed production and in vitro culturing. Fellows a separate list of 16 collections of Dioscorea germplasm with 100 accessions by country, institution, major species & type of material maintained.
Hickling, G. E. Jamaica.

Investigations on the Control of Nematodes in Stored Yams in Jamaica and the Effects of Nematicides on the Germination of Tubers.

International Institute of Tropical Agriculture.

"Yams". Root, Tuber & Vegetable Improvement Program.

Summary of the 1972 IITA activity regarding yams. It is focused on prolonging yam dormancy with Maleic hydrazide & NIA 10656 and then on breaking the dormancy using different products such as gibberellic acid solution of whole tubers.

Kpeglo, K. D., Obigbesan, G. O., Wilson, J. E.

Influence des emgra"


Mantell, S. H. (Caribbean Agric. Resource & Development Institute, West Indies, Univ. of St. Augustine, Trinidad and Tobago), Hague, S. Q.

Incidence of Internal Brown Spot Disease in White Lisbon Yam (Dioscorea Alata) during Storage.


The production of stable convenience foods from root crops involves several steps that may be taken in diverse orders... these steps are part of a larger study aimed at the entire system of delivery food calories from root crops.
Noon, R. A. "Storage and Market Diseases of Yams". Post harvest deterioration through attack by micro-organisms is considered to be the major cause of loss of yam tubers during storage and marketing. Botryodiplodia theobromae, and several species of penicillium and fungi, and bacteria are the main agents. The study describes the conditions under which their micro-organisms are pathogenic, the symptoms of disease produced and methods for their control are discussed. Also, the effects of chilling temperature are analyzed.


Olorunda Ayodele O., Macklon, Alan E. S.

Effects of Storage at Chilling Temperature on the absorption, Salt Retention Capacity and Respiratory Pattern in Yam Tubers.

Observation of the effects of chilling temperature on yams found that incipient chilling injury could be rapidly detected by changes in Ton absorption and salt retention capacity of tuber disks. Chilling effects were also reflected by changes in respiratory rates. This proposed that these techniques can be used for rapid screening of tubers of a wide range of yam varieties, to establish optimum & minimum safe storage temperatures.

Onwueme, I. C.

Influence of Storage time on Earliness of Sprouting and Tubering in Dioscorea rotundata Yams.


Osuji, G. O.

Thermodynamics Applied to the Storage of Yam Tubers.

Tropical root crops: Production & Uses in Africa; Proceeding, 2nd Triennial Symposium; Society for Tropical Root Crops, Africa Branch, Douala, Cameroon, Aug. 83, pp. 143-146.
Dormancy of Yams in Relation to Storage.

Deterioration of Yams and Cassava During Storage.

"GA dip Slows Yam decay".

The application of Gibberellic Acid (GA) was found to be effective in extending the storage life of yams and other root crops by 3 months. Also, curing reduces post-harvest infection. Enclosing tubers in boxes containing a moist packing material could prevent post-curing damages.

Language: English & French. Includes references.

Yams are a tropical, annual root crop while cassava is a perennial crop. The influences of senescence on the storage of yams and cassava are discussed in relation to the physiological roles of the storage organs.


Ricci, P., Colendo, A., Feure, F. (INRA Centre de Recherche des Antilles et de la Guyane, 971 Petit-Bourg, Guadeloupe, France).

Language: English. Summary in French and English.


Language: English. Summary in English.

Riveria, J. R., Gonzales, M. A., Collazo de Rivera, A., Ceuvas-Ruiz, J.

Thompson, A. K., Been, B. O., Perkins, C.

Terche, S., Delpench, F. (Office National de la Recherche Scientifique et Technique outre-Mer, Yaounde, Cameroon).


Language French. Summary in English and French.

Language: English. Summary in French and English.

Ricci, P., Colendo, A., Feure, F. (INRA Centre de Recherche des Antilles et de la Guyane, 971 Petit-Bourg, Guadeloupe, France).

Storage Problems in the Cush-Cush Yam. 2: Control of Penicillium Oxydum rots.

An Improved Method for Storing Yam (Dioscorea alata).

Nematodes in Stored Yams.

Evidence of Thickened Cell Walls in the Parenchyma of Dioscorea dumetorum Tubers after Storage.

Language French. Summary in English and French.

14
Terche, S.,
Delpenche, F.
Le Durvissement de
dioscorea dumetorum
au Cameroun.,
(Hardening of Yams
after harvesting).

Terche, S., Guion,
P. (Office National
de la Recherche
scientifique et
technique, Yaounde,
Cameroun).
Study of the
Nutritional
Potential of Some
Tropical Tubers
Dioscorea dumetorum,
Dioscorea rotundata,
Dioscorea
cayenensis,
Xanthosoma
sagittifolium in
Cameroon, 1:
Influence of
Maturity at Harvest
Time; 2: Storage
Capacity of Tubers
Harvested After
Maturity; 3:
Influence of
Maturity at Harvest
on Storage
Behaviour.

Language of Study: French. Translated Summary in English
Spanish and French.

Ugochukwu, E. N.
(Dep of Biochem.,
Nigeria Univ.,
Nsukka, Nigeria),
Anojike, E. O.
Effects of Storage
Under Nitrogen on
Ethanol, Lactate,
Malate and their
Dehydrogenases in
Yam Tubers.

United States Agency
for International
Development;
University of Idaho
(Storage and
Processing of fruits
and vegetable,
Postharvest
Institute for
Perishable).
Roots and Tubers a
Post Postharvest
Bibliography.

Oxford University
Press. New York,
1982.

Agronomie Tropicale,
Ap-Jn 1979, v.34
(2), pp. 127-156.

Phytochemistry,
1621-1624.

Project # AID/DSAN-
CA-0265, July 1981.
Document type:
Monograph;
Bibliographies.
Wickham, L. D., Passam, H.C., Wilson, L. A.

Tuber Development, Storage and Germination in Yams (Dioscorea spp.), in Response to Preharvest Application of Plant Growth-Regulators (Tuber-Yields Trinidad).

Wilson, Jill.

Careful Storage of Yams: Some Basic Principles to Reduce Losses.

This booklet outlines some important principles which can improve traditional on-farm storages. The illustrations are made from observation in West Africa: Shaded barns of the high rainfall zones, staking in the field and covering with dry plant material in the Savana Zone, Storing in elevated cribs, etc.


## COCOYAMS (Colocasia and Xanthosoma)

<table>
<thead>
<tr>
<th>AUTHOR(S)</th>
<th>TITLE</th>
<th>SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s)</td>
<td>Title</td>
<td>Journal/Source</td>
</tr>
<tr>
<td>------------------------</td>
<td>----------------------------------------------------------------------</td>
<td>-----------------------------------------------------</td>
</tr>
<tr>
<td>Braithwaite, C.W.D.</td>
<td>Preliminary studies on plant parasitic nematodes associated with selected root crops at the University of the West Indies.</td>
<td>Plant Disease Reporter, 56:1077-1079.</td>
</tr>
<tr>
<td>Campbell, L.G.</td>
<td>Mechanizing tropical root crop production.</td>
<td>Span 17(3): 118-120.</td>
</tr>
<tr>
<td>Coursey, D.G. (1967).</td>
<td>Yam storage, a review of yam storage practices and information on storage losses.</td>
<td></td>
</tr>
<tr>
<td>Author(s)</td>
<td>Title</td>
<td>Journal/Publisher</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>-----------------------------------------------------------------------</td>
<td>--------------------------------------------------------</td>
</tr>
<tr>
<td>Author</td>
<td>Title</td>
<td>Source</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
</tbody>
</table>


Opute, F.I. and A.U. Osagie (1978). Fatty acid composition of total lipids from some tropical storage organs (includes potatoes, yams, cassava and cocoyams).


<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Title</th>
<th>Journal/Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUTHOR(S)</td>
<td>TITLE</td>
<td>SOURCE</td>
</tr>
<tr>
<td>----------</td>
<td>-------</td>
<td>--------</td>
</tr>
</tbody>
</table>


Seed potatoes stored in 3 different conditions in 7 months gave different % of weight loss and sprouts: In refrigerated store (5 degrees C) there was a weight loss of 16.6% and sprouts of 4.2 cm; kept in simple store (12.25 degrees C) the measurements showed respectively 28.66% and 3.50 cm; In ordinary farmer's storage (15.5 degrees C) the weight loss was about 43.33% and the sprouts 16.4 cm.


Mechanical damage is a crucial factor in the rapid post-harvest deterioration of cassava roots. Primary deterioration usually commences at the site of cell injury and the pathogens largely invade through these harvest wounds. Like many roots cassava roots can be cured and the onset of primary deterioration prevented.

The study discusses these considerations and gives practical advice especially regarding the techniques of storage boxes and in field camps.


"Traditional Post-harvest Technology of tropical Perishable Staples."

Traditional techniques are studied as the mostly best suited methods to the small or medium scale operation of the subsistence sector and for the expanding market economics. For the big scales modern techniques such as refrigeration, controlled atmosphere or hypobaric storage may become optimal.

The article recommends to carefully examine all the advantages offered by the traditional techniques more suited to the small production.
"Postharvest Problems of Non-Grain Staples."

The tropical staple foods other than grains, are much more important, especially in humid tropical ecosystems, than is generally appreciated. These non-grain staples includes...cassava, yams, potatoes, cocoyam and crop products.
...Postharvest losses in these crops is at 25%.
The paper discusses some consideration common to all non-grain staples, and also major crop-specific problems.

"Village Level Technology on Cassava Storage."

Microbial Spoilage of Packaged Gari in Storage.

Germination of Stored Cassava Seed at Constant and Alternating Temperatures.

Cassava Roots Storage and Post Harvest Deterioration.

The Radix: Philippine Root Crop Research & Training Center (v.3, Jan-June 1981. ISSN#: 0115-4346. p.17).


Karmantha, Mar. v.5(3) p.11.
Physiological Studies on Postharvest Deterioration of Cassava Roots.

In series of experiments conducted between 1981 and 1984 it was found that: cv differences appear more clearly in tissue blocks than in intact tubers; PD was negatively correlated with root moisture content at harvest and positively correlated with starch content. The experiments showed also that: Pruning to 30 cm 2-3 weeks before harvest delayed PD; Root piece respiration rate increase in injured roots; root ethylene content varied between pruned and unpruned plants but application of ethrel did not affect root tissue respiration rate.
Ingram, Jean, S., Humphries, J.R.

"Cassava Storage. A Review."

Few reliable data on techniques for preserving and storing fresh cassava exist. Apparently, the most effective measure appears to be refrigeration...But in tropical countries this would be too expensive. The study presents some other methods such as those described by Reine in 1741, sealed container storage, etc...It insists on the necessity for further researches into informal storage procedures at or near subsistence farming level, using local materials and methods which are within the reach of, and acceptable to local producers.


Cassava Storage - A Review.
Kawano, K., Rojanaridpiched, C. (CIAT, AA G7-13 Cali, Colombia).


Genetic Study on Post-harvest root deterioration in cassava.

Series of experiments conducted in Bolivia between 1974-80 indicated that inheritance of post-harvest root deterioration is partially controlled by additive and quantitative factors (rather than qualitative). Genotype x environment factors were highly significant.

Estimation of Starch and total fermentables contents in storage roots of cassava (Manihot esculenta Crantz).


New Development in Cassava Storage.

Experimental results show that physiological deterioration can be prevented either by pruning the plants 2-3 weeks before harvest or by packing the roots in polyethylene-lined paper bags after harvest.

Microbial deterioration can be prevented by dip-treating the roots with broad-spectrum fungicide such as manzate.

Storage of the fresh Cassava Roots in Moist Coir Dust (Manihot esculenta, Almacenamanto).

"Beans, Cassava, Groundnuts and Sweet Potatoes." A guide to Handling and Storage.

A Preliminary Study of Preplant Cassava Stem Storage on Tuber Yield; Note.
Storage of Cassava Chips (Manihot esculenta): Insects Infection & Damage.

Anthropods Infesting Stored Cassava (Manihot esculenta crantz) in Peninsular, Malaysia.

Ten arachnid and sixty insect species were found in a sample of cassava chips from different locations of the Malaysian peninsula. The most abundant species were Rhyzopertha dominica, Lipoacelis sp and Tribolium castaneum. Also Sitophilus Zeamais and cryptolestes Klapppericliu were very common.

Small-Scale Processing and Storage of Tropical Root Crops.

Post-Harvest Storage of Cassava Tubers under Modified Environmental Conditions.

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Title and Details</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Review and updating of earlier literature review (NAR 43, 1675) on cassava storage.</td>
</tr>
<tr>
<td>Skiles, Robert L.</td>
<td>&quot;Postharvest Storage for Perishable Crops.&quot;/ Draft article.</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>AUTHOR(S)</th>
<th>TITLE</th>
<th>SOURCE</th>
</tr>
</thead>
</table>

The study of root weight loss, dry matter changes and intercellular space during storage concludes that Jewel is the only Ipomoea batatas selection with excellent storage characteristics and high storage potential.
Hancock, K.W. (Mississippi State Univ. Miss. State, MS. 39762-USA).

"A Study of Growth regulators IAA - oxidase, and watering levels on storage root initiation in sweet potato (Ipomoea batatas L. Lam)."

Application of IAA, BA, and GA to Sweet Potato CV showed IAA was evenly distributed among CV, but it was higher on MS-33 than in M3-702.


"A study on the effects of storage periods and three temperature regimes on weight loss of potato tubers [in Australia].

A 6 month study of weight loss in 3 different sets of temperature (3-4 degrees C, 13-18 degrees C, 22-27 degrees C) showed that greater loss of weight and rotteny occurred during later stages of storage at high temperature.


Losses in Sweet Potatoes (Ipomoea batatas) stored under traditional conditions in Bangladesh.

Mississippi State University, Mississippi State, MS. 39762 USA.


Virus-Free Sweet Potato Storage Roots Derived from Meristem-Tips and Leaf Cuttings.

The effect of liming on yield, nutrition, and copper status of potatoes, carrots and onions grown sequentially in two peat soils.

Postharvest storage and handling of Sweet Potatoes.

Freezing Yams or Sweet Potatoes.
This pamphlet focuses on the techniques for storing partially backed and partially canned "yams".

Post harvest Storage Characteristics of Sweet Potatoes.

Post Harvest Loss in Sweet Potato in Relation to Common Methods of Harvest and Storage; Note.

Scientia Horticulturae v.26(3) pp. 231-240.


Louisiana, cooperative extension service publications. 1964.


Saladaga, F.A.; Hernandez, T.P. (1981). (Louisiana State University, Louisiana (USA).) Heritability and Expected Grains From Selection for Yield, Weight Loss in Storage and Sprouting in Field Bed of Sweet Potato Study Conducted in Louisiana, USA.

Frequency distribution and heritability estimates were analyzed for yield, weight loss in storage and sprouting in field bed of a true seed of sweet potato. It was found that the genetic variance was negative, the heritability negative or zero, sprouting also had low genetic variance. This implies that either the population under study has already attained its potential limits for these traits or that these traits are largely influenced by the environment.

Singh, N.; Mukherjee, P.K. (1976). (Government Horticultural research Institute, Saharanpur, India). Storage of Sweet Potato (Ipomea Batatas Poir) India; Note.
Thompson, H.C. Sweet Potato Storage
HC Thompson.

Wagner, A.B. HJHSA; Burns, E.E.; Paterson, D.R.

Washington, D.C., U.S. Department of Agriculture, #970.

HortScience v.18(3), pp. 336-338. ill.