READERS' CORNER

Cassava news via BBC-London

David Dixon, producer of "The Farming World" keeps BBC listeners abreast of the latest developments in cassava by reviewing articles from the Cassava Newsletter, as well as publications from CIATs Cassava Information Center and from IITA.

For those of our readers who would like to tune in, this program is broadcast weekly as follows: Tuesday (1830 GMT), Wednesday (1130 GMT) and Thursday (0830 GMT).

He would also welcome material on other crops of interest to farmers around the world from those of our readers who would be willing to contribute information. The address is

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Theses on cassava

Miguel Sosa of the U. Federal de Viçosa (Minas Gerais, Brazil) informs us that he has changed the subject of this thesis from "Study of substances that induce rooting of cassava" (Cassava Newsletter no. 4) to "Effect of NPK on the syntnesis and translocation of HCN and acid-digestible carbohydrates in cassava."

S.N. Kutianawala, a student from Tanzania, is working towards a higher research degree at the Dept. of Food Science of the University of Reading, England. The subject of his thesis is "Potential utilization of cassava as an industrial crop."

Proceso Manguiat, research assistant at the U. of the Philippines at Los Baños, is doing his MS thesis on "The initiation of flower formation in nonflowering cultivars of cassava."

Change of name

The Instituto de Pesquisa Agropecuária do Centro Sul - IPEACS of Guanabara, RJ has changed its name and address as follows: Itaguí Experimental Station, PESAGRO-RIO, Estrada Rio-São Paulo, km 47, 23460 - Seropédica, RJ.

Who's who in cassava

As the first in a series of biographical sketches we would like to do on those who have made significant contributions to cassava, we are pleased to present this dedication to EDGARD SANT'ANNA NORMANHA, who has done so much for cassava research in Brazil. Many thanks to Eng. Agr. Jairo Ribeiro da Silva, editor of MANDI-NOTICIAS, for taking the time out from his busy schedule to write this sketch. For our next issue we hope to have one on Alvaro Montaldo, from the Universidad Central de Venezuela, Maracay, who has just published a book on cassava.

Cooking with cassava

Your Cassava Newsletter fascinates and interests me. We have been taking and making all sorts of "eats" of the cassava here at home where it is really a delicacy. We will send a recipe as soon as we sort out the right proportions of the ingredients. So, could you please send me a copy of your Cassava Newsletter? Also, back issues? My address: Mrs. Estne: Santos Bastao. Central Philippine University, Jaro, Iloilo City, Philippines.

We recommend your getting in touch with Dr. Barry Nestel, 39 Hatchlands Rd., Redhill, RH1 6AT, England, who is working on a book of cassava recipes in his spare time.

TISSUE CULTURE METHODS FOR THE INTERNATIONAL EXCHANGE AND CONSERVATION OF CASSAVA GERMPLASM

13231

W.M. Roca, Physiologist
CIAT

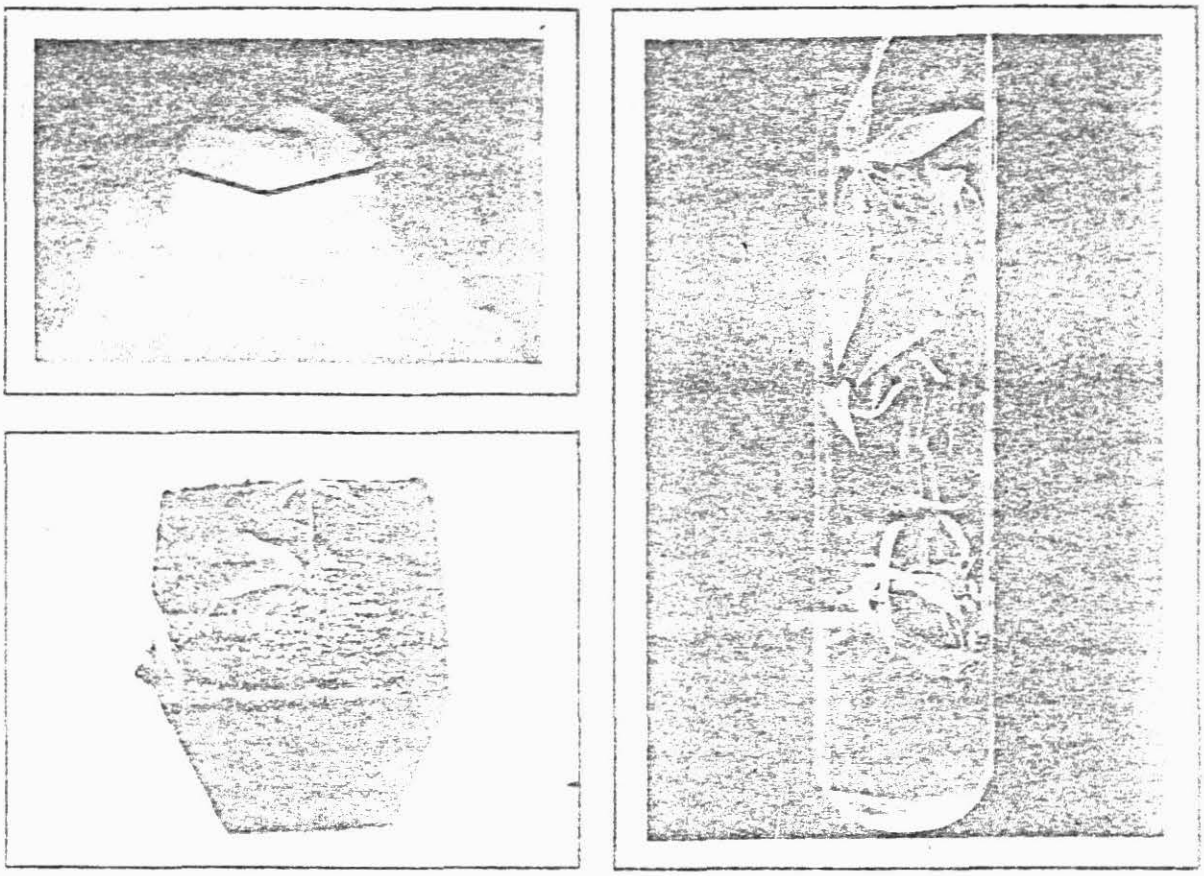
CIATs collection of cassava germplasm currently comprises nearly 2500 entries and another 1000 accessions are expected in the near future. The collection is maintained mainly in clonal form by continuous field cultivation. This method is expensive and increases the risk of material being lost, particularly as a result of pests and diseases. Similarly, the exchange of valuable materials with other countries is often restricted by strict quarantine barriers that prevent the distribution of vegetative materials because of the hazards of disseminating pests and diseases.

Tissue culture methods can be used as an alternative to traditional clonal propagation and storage to reduce or eliminate such risks (1-3). Research was initiated last year in the Genetic Resources Unit in cooperation with the Cassava Program aimed at developing meristem tissue culture methods for the international exchange and the long-term preservation of cassava germplasm in disease-free conditions.

Exchange trials of cassava in the form of meristem cultures with the Brasilian germplasm center CENARGEN have been made in order to develop simple methods of culture establishment, packing and handling at the receiving end.

These procedures should be fully developed by the end of this year. Briefly, the methodology consists of the following steps:

1. Depending on the facilities of the recipient institution, the most appropriate system is chosen for shipment of the



Figures 1-3: Sequential development of cassava plants from meristem culture. (1) A dissected shoot apex showing the dome-shaped meristem tip flanked by the two youngest leaf primordia; (2) A six-week-old plantlet derived from meristem culture. (3) A plant derived from meristem culture after potting at six weeks.

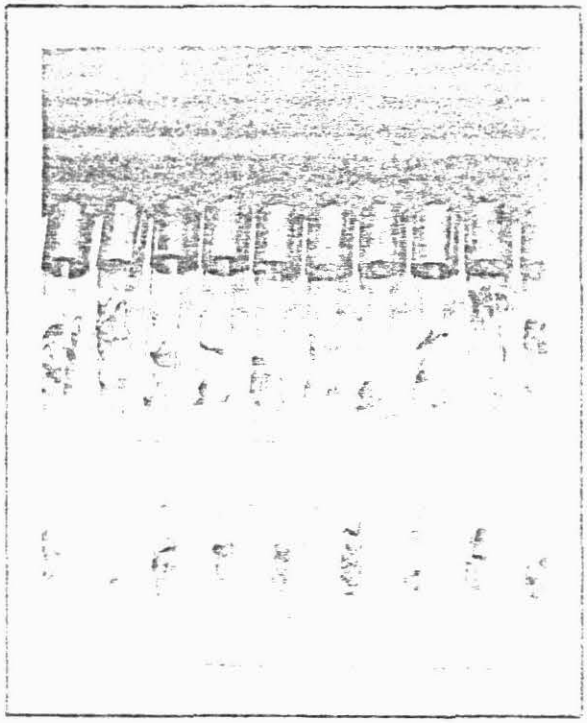


Figure 4: Cassava germplasm maintained as very slow-growing meristem cultures.

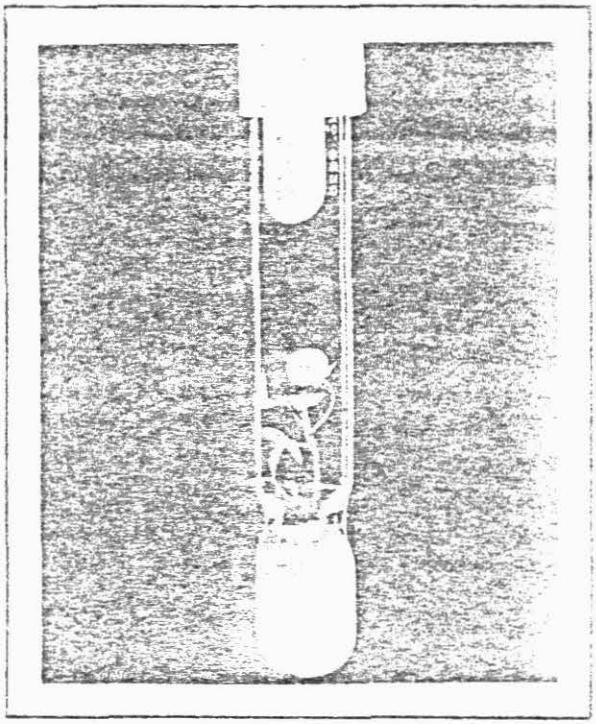


Figure 5: A cassava meristem culture ready for international transfer in disease-free condition.

aseptic cultures, in vitro, in the form of:

a. A single fully developed plantlet
b. Single meristems
c. Multiple-shoot cultures

2. The simplest way to handle the cultures as in "a" is to transfer to pots after a short hardening period.

System "b" requires keeping the cultures in the test tubes after their arrival and then transferring them to fresh media in order to promote their growth. The advantage is that up to 10 meristems can be shipped in a single test tube.

System "c" is the most promising from the point of view of handling and propagation: we are developing a system which so far yields up to 20 plantlets from a single shoot tip through the enhancement of axiliary buds. Thus in a single test tube, a multiple-shoot culture provides a source of shoots which, after transfer to another media, form complete plantlets quickly. These are then potted.

3. Once the meristems have been implanted on the aseptic culture media, these are set in the incubation room for a period of at least 15 days before packing and shipment. During this time, any fungal or bacterial contaminants should grow and contaminate the media. Should this happen, these cultures are discarded.

4. In the event of materials that may be infected with a virus-like disease, the procedure consists first in eradicating the diseases by means of a proper combination of thermotherapy and meristem culture. Once the resulting plants have been thoroughly tested for the disease, then shoot tip cultures are done from healthy plants and used for shipment as in 3.

5. Plans are to introduce cassava collections from Peru and Brazil to CIAT, in the form of meristem cultures. This work, to be initiated shortly, will be done in close collaboration with the Colombian plant health authorities.

6. Ongoing research is being done on the development of conservation methods in order to extend the period between transfers of the cultures to 2 years or longer. So far, very promising results have been obtained.

Meristem cultures stored for 10 months at low temperature (20°C) exhibited a rate of growth of only 3 mm/month. This rate of growth could be further reduced, without any reduction in culture survival, by slight changes in the chemical composition of the media. All cultures produced new growth when transferred to active growth media. Further research is being carried out to provide definite information on optimal conservation temperatures and minimal media, propagation and genotype stability of materials recovered from storage.

Work has also been initiated, in collaboration with CIAT, at the Prairie Regional Laboratory, Saskatoon, Canada, and the U. of Birmingham, England, to study the feasibility of maintaining cassava meristems at the temperature of liquid nitrogen.

Training of personnel from recipient countries in the techniques for recovery, testing and propagation of stocks is an important aspect of the exchange program (see news on forthcoming course, p. 15).

Literature cited

1. WESTCOTT, R.J.; HENSHAW, G.G.; GRANT, B.W.W. and ROCA, W.M. 1977. Tissue culture methods and germplasm storage in potato. Acta Hortic. 78:45-49.

2. ROCA, W.M.; ESPINOZA, N.O.; ROCA, M.R. and BRYAN, J.E. 1978. A tissue culture method for the rapid propagation of potatoes. Am. Potato J. 55:691-701.

3. ROCA, W.M.; BRYAN, J.E. and ROCA, M.R. 1979. Tissue culture for the international transfer of potato genetic resources. Am. Potato J. 56:1-10.

THE ROOT & TUBER IMPROVEMENT PROGRAM AT IITA *

This program was begun in 1971 with the purpose of improving the production of cassava, yams and sweet potatoes in tropical Africa, where the supply is inadequate to meet the demands of more than 80 million people who depend almost entirely on these crops as their staple foods. The main objectives of the program are to seek plants with high, stable yields, carrying resistance to economically important diseases and insects, adaptable to a wide range of environments and production methods, and having better storability and improved quality in terms of consumer acceptance, nutritional value and processing characteristics.

A number of improved lines have been developed and introduced to the farmers through national food production programs. Resistance of IITA-developed clones to African cassava mosaic and cassava bacterial blight, which have caused severe yield losses as high as 80% on some farms, has proven to be stable in several countries. In addition, cassava materials from exotic sources have been successfully improved for resistance not only to diseases but also to lodging.

* Data taken from The challenge of the tropics, International Institute of Tropical Agriculture, Ibadan, Nigeria