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REPORT ON A VISIT BY R.H. BOOTH & D.W. WHOLEY TO THE INSTITUTO DE INVESTIGACIONES TECNOLOGICAS (IIT) AND THE PROGRAMA DE DESARROLLO Y DIVERSIFICACION DE ZONAS CAFETERAS, BOGOTA 16 - 18 JANUARY, 1973



INSTITUTO DE INVESTIGACIONES TECNOLOGICAS (IIT)

Discussions were held with Dra. Teresa Salazar de Buckle, head of the special projects department on the work recently undertaken on the post-harvest behaviour and storage of cassava roots. Dra. de Buckle explained the processes of deterioration and the manner in which IIT had approached the problem. Attached is a copy of the report published in 'Technologia' IIT's own journal.

Briefly the successful waxing process involves the selection of undamaged roots, which are then washed, dried and immersed in melted paraffin wax at 90°C for 45 seconds. The importance of damage to the roots was discussed and it was mutually agreed that this subject presented many problems associated with varieties, soil types and extension work regard to harvesting and handling methodology.

Using the above process waxed roots were stored without deterioration for 30 days under a storage temperature of 18°C. However at a temperature of 30°C some 50% of the roots deteriorated within the 30 day period. Handling of waxed roots was discussed and it was emphasized that transportation in boxes, instead of sacks was necessary to prevent injury to the wax coating.

Enquiries were made into the physiological explanations for deterioration arrived at by I.I.T. It was decided that the association between peroxidase

activity and discolouration of roots was not clearly defined and Dra. de Buckle agreed that further work was necessary in this field. Dr. Booth noted that Tropical Products Institute had both the interest and expertise in this field, Dra. de Buckle stated that she could see no reason why TPI should not proceed with the studies.

On the subject of quality changes during storage, Dra. de Buckle explained how an increase in reducing sugars was measured, although waxed roots contained less than non waxed roots. An organoleptic panel formed and trained by I.I.T. showed that this increase in sugars did not adversely affect consumer quality, expressed as colour, texture, taste & smell.

Dr. Booth explained how his work with simple soil/straw silos was progressing favourably and demonstrated a yuca root which had been stored for 9 weeks in this type of silo. Dra. de Buckle was both surprised and pleased, and on inspection of the root became very interested in the obvious changes in the sugar content. It was pointed out that from preliminary cooking tests, it was apparent that some changes had occurred, and Dra. de Buckle suggested that the starch gelatinization temperature may have altered during storage.

At this point Dra. de Buckle explained that although the special project on yuca storage had been terminated, IIT was still interested in working with the sugar and starch aspects of storage work. This is because IIT has studies underway on the industrialization of starch for the paper and textile industries. Dr. Booth suggested mutual cooperation and both parties agreed

to discuss the subject with their superiors. Further assistance to CIAT was offered by IIT in the form of access to the organoleptic panel.

The problem of storage of planting material of yuca was explained to Dra. de Buckle and questions placed regarding waxing technique. It was learned that higher wax temperatures (90-100°C) did not appear to kill cells and produced a better moisture proof layer than waxes at lower temperatures. Similarly dipping the waxed roots into cold water, 'tempered' the wax preventing the wax coating from becoming detached from the root surface, a condition which allows fungal growth. A fungicide suitable for mixing with paraffin and aqueous waxes produced by Hoersch were recommended for trial.

In general the enthusiasm of IIT was encouraging, and it is anticipated that very productive cooperative work will result. Dra. de Buckle was interested in other aspects of CIAT's work, particularly in maize & rice and stated that she would be delighted to deliver a seminar, not only on aspects of cassava storage but also on other zones of common interests between CIAT & IIT.

Programa de Desarrollo y Diversificación de Zonas Cafeteras (F.N.C.C.)

A series of meetings were held with the Director Dr. Hugo Valdez S., Mr. Kenneth Masters (Technical Aid, British Overseas Development Administration), Sr. Jorge Gomez and other officers of the Cafeteros.

General discussion revealed that the program was looking at yuca as a

potential crop for diversification. Already some useful data has been collected and quite considerable experience in production and marketing of yuca has been gained. The Cafeteros at present are thinking in terms of yuca production for the Bogota market and presented us with a copy of an internal paper describing among other things marketing procedure, supply & demand estimates, and price fluctuations (copy appended).

Dr. Booth described the straw/soil silo system and the general reaction showed that the storage of cassava posed real problems in marketing fresh roots. In fact it was revealed that the Cafeteros were considering the purchase of equipment for waxing roots, using the system developed by IIT.

The Director of the diversification program showed great interest and asked many questions during the meeting. He offered his assistance and stated - that he could collaborate by placing all his facilities at Dr. Booth 's disposal as soon as requested. Preliminary discussions were made to delineate mutual areas of interest. Dr. Booth explained how he would like to store yuca under farm conditions at three sites and send the stored product through normal marketing channels, used by the Cafeteros, to Bogota market. The Director gave tacit agreement to this and invited Dr. Booth back to Bogota in the near future to address a meeting of the technical and marketing staff in the diversification programme stationed in Manizales and Tuluá, at which the details of the co-operative effort will be decided.

Through Sr. Jorge Gomez, contact was established with a farm near Manizales

which had 70 hectares of yuca ready for harvesting. This was placed at the disposal of Dr. Booth who plans to travel there immediately he has approval for the co-operative program and after the details have been decided at the Bogota meeting.

The Cafeteros were asked how the storage of cassava planting material between one harvest and the next planting was handled. This, it was agreed, posed an important limiting factor on production techniques and it was learnt that a large number of farmers relied on supplies of planting material produced by a number of farmers in Caldas, rather than preserve their own planting material. The obvious impact on dissemination of new varieties was realised. The farmers plant whatever variety they can purchase, rather than choosing a particular variety.

It was decided that Mr. Wholey together with Dr. Booth should go to Manizales, make contact with the Agronomist Ober Sanint and discuss further how the work at CIAT on planting material storage techniques may be enhanced by cooperative effort with the Cafeteros. Mr. Wholey pointed out that the initial step would be to collect data quantifying the problem, and determine the methods at present used for planting material storage. Only then would it be possible to design experiments to select the best method of storage.

Dr. Valdez, Director, was interested in establishing closer contact with CIAT and is likely to send his technical staff to visit the program at CIAT in the not too distant future. An agronomist (Samuel Garcia) working in his program

spent one year with the CIAT Cassava Program as a trainee. Dr. Valdez indicated that a member of his technical staff would be pleased to deliver a seminar to the CIAT cassava workers, to present the production problems encountered by the diversification program.

Summary of trip

Storage of roots - Excited and enthusiastic to cooperate at both Institutions. IIT offer laboratory analysis on reducing sugars and starch, and organoleptic panel for consumer acceptance studies. The Cafeteros offer a large supply of roots for further storage work, three sites on farms to locate the silos, and the marketing outlets already operating to examine transportation and marketing problems of stored roots.

Storage of planting material - IIT offered useful information on technique, additives and alternative waxing materials .

The Cafeteros were pleased to find someone working on this problem and offered complete co-operation in obtaining data and performing experimental work on the farms under their jurisdiction.