

# THE INFORMATION CENTER AT CIAT

F. Monge \*

## SUMMARY

1500 articles from the widely scattered literature on cassava have been assembled and processed as abstracts and keywords. The summary cards are linked to a retrieval system on the TERMATREX principle. Complete sets of abstract cards can be obtained or a selected set of references to cover particular topics can be ordered.

## RESUME

1500 articles d'ouvrages sur le manioc dispersés ca et là ont été rassemblés sous forme de documents classés. Les fiches ont un système de récupération basé sur la méthode TERMATREX. On peut obtenir des collections de ces fiches au complet ou commander des collections couvrant un sujet précis.

## RESUMEN

1500 artículos provenientes de literatura sobre yuca ampliamente dispersa se han concatenado y procesado como compendios y palabras clave. Las tarjetas-resumen se eslabonan a un sistema de recuperación sobre el principio TERMATREX. Se pueden obtener juegos completos de tarjetas compendio o se pueden ordenar juegos seleccionados de referencias para cubrir un tema determinado.

## INTRODUCTION

The Centro Internacional de Agricultura Tropical, CIAT, is directed toward the agricultural and economic development of the lowland tropics. CIAT seeks to assist such development through research and training, and the stimulation and strengthening of national capacities in both these areas. The specific action targets of CIAT programmes are:

1. Agricultural Development, as indexed by *increased productivity per person and per unit of area, as well as increased output* of the basic food commodities of the area served.
2. Institutional Development, as evidenced by increased willingness, technical competence, and organizational ability of national institutions to cope with continuing problems related to agricultural and economic development in the lowland tropics.

CIAT concentrates efforts and resources on six agricultural commodities for lowland farming systems — beef, cassava, beans, swine, rice and corn. In addition, CIAT is also concerned with overall agricultural production systems for tropical areas.

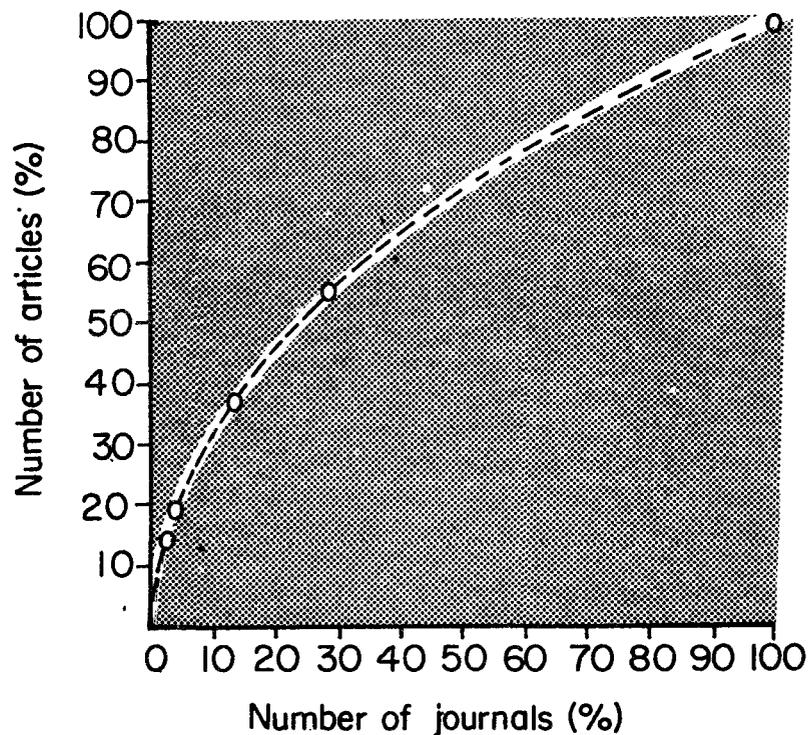
CIAT's systems approach to solving problems calls for a specialization in terms of problems rather than disciplines. If a library is to be an effective tool with such an organization, it must also mirror the organizational nature of the institution and its philosophy. Thus the CIAT library and information service is crop oriented.

## THE CASSAVA LITERATURE

Since cassava is one of the commodities receiving major emphasis at CIAT, our information activities on this crop are similarly strong. However, the literature on cassava is sparse as traditionally it has been considered a 'backyard crop' and only sporadically has systematic research been done on it. Consequently, cassava literature is scattered through a wide range of publications from many countries.

In 1971, a preliminary analysis of the scope of the cassava literature was performed<sup>1</sup>. A sample of 162 articles published in the last four years was obtained from a search done at the National Agricultural Library, Beltsville, Maryland. Figure 1 illustrates the results of plotting the number of articles against the cumulative number of journals ordered from those with the greatest to those with the least number of articles on cassava.

\*Associate Communication Scientist and Librarian, Centro Internacional de Agricultura Tropical, CIAT, P.O. Box 6713, Cali, Colombia.



This curve shows that approximately 50 percent of the articles published on cassava appear in a core group of 28 percent of the journals, and therefore, covering the remaining 50 percent of the articles requires subscription to a great number of marginal journals. Elaborating these data further, a reference-scatter coefficient can be calculated, which is a numerical indicator of the diversity of journals in which information on a particular area appears. While the reference-scatter coefficient for all tropical and subtropical agriculture literature as calculated by Lawani<sup>2</sup> is 0.61, the coefficient for cassava (on the basis of the above-mentioned sample) is 0.93. For comparison, in a more specialized field, the petroleum literature, has a reference-scatter coefficient of 0.43<sup>3</sup>.

The wide scatter of the cassava literature and the need for centralizing all cassava literature as well as being able to provide rapid access to information on any specialized aspect of cassava research and practice, made CIAT adopt a document-by-document approach in conjunction with a simple mechanized system of information handling.

#### THE CIAT CASSAVA DOCUMENTATION SYSTEM

With the partial support of the International Development Research Centre, IDRC, of Canada, the Cassava Information Center was established as a special project under the Library and Documentation Services Program of CIAT. Since the total production of cassava documents in the world is rather small (estimated around 4,000) the Cassava Information Center aims at collecting all the literature produced on this crop. In order to accomplish this, the CIAT Librarian travelled to several institutions in the world that were likely to have at least significant portions of the cassava literature in their holdings. Some of the institutions visited were the Royal Tropical Institute (Holland), the Tropical Products Institute (England), the Institut pour le Recherche Agronomique Tropicale, IRAT (France), and others, where copies of all their cassava references were made for future ordering of photocopies of documents. Additional contacts were made by mail and specific searches were requested from institutions such as the National Agricultural Library, Beltsville, Maryland, USA, the Instituto Brasileiro de Bibliotecologia e Documentacao, IDDB, Rio de Janeiro, Brazil, etc.

The final result of this initial effort to collect references was represented by 20 separate lists each containing from approximately 200 to 2,000 cassava references, on the basis of which, acquisition activities began. Of the estimated 4,000 documents existing in the world on this crop, approximately 3,500 have been identified and ordered by CIAT, and nearly 3,000 have already arrived.

Processing the documents after arrival is a time-consuming operation. An accession number is given to each document regardless of topic. This number will identify the document throughout its 'life' in the Center. Once the complete literature citation is obtained and written according to the rules adopted by the Center, a search for an already existing abstract in any of the standard Abstract Journals is performed. If this search proves to be unsuccessful, an abstract is drawn up by our cassava specialist in the Library who is an M.S. agronomist. In some specific instances, however, a paper may require more specialized treatment,

so our team of cassava specialists collaborates in making abstracts or giving technical assistance to our information science personnel.

Perhaps the most critical step in the processing of documents is that of assigning key-words or descriptors to the document, since these constitute the handles, so to speak, through which documents will be located afterwards when searches on specific topics, or individual interest profiles are performed. Although key-words are obtained from the document title and text itself, many complex problems may arise in the actual use of particular words for descriptors. As an example, the word *Nitrogen* is most likely linked with the field of *Fertilizers*. However, after performing one of our first searches on this topic, we realized that *Nitrogen* is also quite frequent in the context of *Foliar analysis* and, consequently, provisions have to be made in the system to correct for this and other types of problems.

Key-words, therefore, are not included in the system without careful consideration of their possible meanings and relations to other key-words. With the help of a thesaurus specialist, Mr. Donald Leatherdale from IDRC, a specialized cassava thesaurus was produced, which constitutes the 'official register' of terms used by the Center. In addition, this thesaurus is an invaluable tool for searching, since it includes broader terms (BT), narrower terms (NT), related terms (RT), and scope use, and use of notes (SN, USE, UF) which help to determine the specific meanings or usage of a certain term. The following example of thesauri terms may be helpful in illustrating this point.

PRICE MAINTENANCE  
BT PRICES

PRICES

SN: Use for cassava products and comparative data only  
BT ECONOMICS  
NT PRICE MAINTENANCE  
RT CASSAVA PRODUCTS

PROCESSED PRODUCTS

BT CASSAVA PRODUCTS  
NT CASSAREEP  
CASSAVA BEER  
CASSAVA MEAL  
DRIED TUBERS  
PULP  
TAPIOCA FLOUR  
RT FERMENTED PRODUCTS

PROCESSING

SN: Processing of tubers to the manufacture (but not use) of cassava products  
NT BOILING  
CENTRIFUGING  
DRYING  
FERMENTATION  
GELATINIZATION  
GRINDING  
PEELING  
PRESSING  
PULPING  
RASPING  
SCREENING  
SILTING  
STEEPING  
WASHING  
RT MECHANIZATION  
NUTRIENT LOSS  
WATER REQUIREMENTS (PROCESSING)

Product applications  
USE USES

PRODUCTION  
RT ECONOMICS  
FACTORIES  
FORESTRY  
MARKETING

Product costs  
USE COSTS

PRODUCTIVITY  
UF LOSS OF YIELD  
YIELDS  
NT ENERGY PRODUCTIVITY  
STARCH PRODUCTIVITY  
TUBER PRODUCTIVITY  
RT WASTES

The output of the system is a card containing the bibliographic citation, the key-words and an abstract of the document. Figure 2 shows a typical abstract card.

CIAT, Apartado aéreo 6713, Cali, Colombia

1766 SILVA, W.J. DA Plano de melhoramento da mandioca (*Manihot esculenta* Crantz). (Cassava a breeding program). Agronômico 23:100-116. 1971. Port., 7 Fels., Illus.

Cassava. *Manihot esculenta*. *Manihot melanobasis*. *Manihot saxicola*. Cassava programs. Plant breeding. Brazil.

Work done on cassava breeding in Madagascar, Tanzania, Indonesia, India and Brazil is discussed in order to establish a parallel to the following program, which should be carried out in chronological order: (1) collection of material to form a germplasm bank. Progeny of *Manihot melanobasis* and *M. saxicola* should be included because of the favorable characters they can contribute toward improving *M. esculenta*; (2) screening of promising material in yield trials; and (3) crossing of selected clones. Steps taken to incorporate genetic variability through hybridization include dialled crosses, self-pollination and individual crosses of self-pollinated plants. (Summary by S.S. de S. Trans. by T.M.) G01

Figure 2. A typical abstract card.

## INFORMATION RETRIEVAL SYSTEM

The system used for retrieval is based on the principle of optical coincidence of interior-punched cards. As described by the REMAC International Corp., manufacturers of the equipment used in our Center, "TERMATREX is a system for storing and retrieving information. The system, like all data and information systems, consists of items such as a research report, personnel records, correspondence etc., which are indexed for the system, and characteristics, which are the terms used to describe these items. TERMATREX, however, is an inverted retrieval system. Where conventional systems employ a card for each item and indicate characteristics on this card, TERMATREX uses a card for each characteristic and indicates on the card every item having this characteristic.

Each TERMATREX card represents one characteristic, key word, or term. On every card there are 10,000 distinct positions. One item is assigned to each of these positions. A hole is drilled in the position assigned to an item to indicate 'yes', this item has the characteristic represented by the card. The absence of a hole in the card means, 'no' this item does not have this characteristic. The information in the TERMATREX system is searched by posing a question, selecting the card or cards representing the characteristics encompassed by the question, and superimposing these cards over a light source. The holes drilled to indicate 'yes' will allow light to pass through, indicating that the items represented by these positions contain material relevant to the question asked. The accession numbers of the items desired are easily determined using scale devices. The number of holes showing are rapidly counted using an automatic counting device.'

## SERVICES PROVIDED BY THE CENTER

The Cassava Information Center at CIAT provides two types of services. One is a *current awareness service* by which all abstract cards are regularly distributed to subscribers.\* Although the capacity for selective dissemination of information according to specific interest profiles exists within the system, this is not being done at present since it is considered that information on cassava is very scanty anyhow, and thus, cards dealing with topics not falling within the specific interest of a particular scientist may be passed on to other colleagues or institutions that would welcome this type of information.

The other service provided by the Center is *retrospective searches* performed on specific topics upon request. These are charged at the rate of US\$5.00 per search and always cover the entire data base at a given point in time. The user receives a set of those abstract cards dealing with the topic or combination of topics requested.

## PROJECTIONS FOR 1974

The Center has processed to date approximately 1,500 articles. It is expected that during 1974, an additional 2,000 to 2,500 articles will be fully processed, thus completing the major portion of past literature. Efforts, however, will not be concentrated only on past literature but the Center will continue its present policy of giving first priority to processing current articles appearing in the literature.

Our plans for 1974 also include the publication of a bibliography in book-form of all the citations and abstracts of articles in the Cassava Information Center. Presently, all abstract cards produced at the Center are sent to IDRC in Ottawa where they are sorted by main topic in order to produce the text of the bibliography by computer. It is thought that a book-form bibliography will constitute a permanent record for cassava workers, without duplicating the flexibility of specific multi-topic searches attained by means of abstract cards.

A Directory of Cassava Workers is also being compiled. This publication will be useful in increasing communication among scientists working on this crop and, at the same time, it may be the basis for an author citation analysis to be started in the near future.

Finally, although the initiative in centralizing all cassava information and providing a rapid and versatile service to cassava scientists has been taken by IDRC and CIAT, the success of any information project depends heavily on the direct participation of those people who are the final users of the service. Consequently, we ask your personal collaboration in letting us know about new information appearing in the field in whatever form it may be. Our policy is not to be restricted only to the better established forms of publication. Internal reports, and even memoranda, frequently carry very useful and recent information that could and should be included in our service. We hope to extend and organize as far as possible, the informal network of information — sometimes called an 'invisible college' of cassava scientists so that benefits may be derived from the sharing of information by a greater number of people.

## REFERENCES

1. CIAT Annual Report 1971, p. 114.
2. Lawani, S.M. Periodical literature of tropical and sub-tropical agriculture. UNESCO Bulletin for Libraries 26(2), 88-93. March-April, 1972.
3. Cole, P.F. A new look at reference scattering. Journal of documentation. 18(2), 58-64. June, 1962.
4. REMAC International Corp. How TERMATREX works. Descriptive pamphlet.

\*Current price of subscription US\$3.00 includes initial set of approximately 1,200 abstract cards.