

The Semi-Arid Tropical Crops Information Service (SATCRIS): Information Products and Services on Groundnut

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Abstract

The history of the Semi-Arid Tropical Crops Information Service (SATCRIS) project, its broad objectives, and the beneficiaries of its services are described. SATCRIS builds its database by drawing information not only from agricultural databases but also from food science and biological science databases. The plan for the building of a time-series database on crops mandated to ICRISAT is indicated. SATCRIS operates an automated Selective Dissemination of Information (SDI), and conducts information searches, contributes to specialist abstracts, and conducts information analysis. Plans to build a prototype expert advisory system on groundnut (Arachis hypogaea) diseases identification and control, and the objectives of such a system are introduced. SATCRIS has created a specialized database on the groundnut aflatoxin problem and plans to sensitize information users in Africa to its resources and services through participation in regional workshops.

Résumé

Le service d'information sur les cultures des zones tropicales semi-arides (SATCRIS)—produits et services de l'information sur l'arachide: L'histoire du projet SATCRIS, avec ses principaux grands objectifs et les usagers de ses services sont décrits. Le SATCRIS développe sa banque de données en puisant dans les informations fournies non seulement par les banques de données agricoles mais aussi dans les domaines de la science alimentaire et de la biologie. Le plan de construction d'une banque de données numérique à série dans le temps sur les cultures placées sous le mandat de l'ICRISAT est indiqué. Le SATCRIS opère une diffusion sélective automatisée de l'information (SDI) et entreprend des recherches d'information, contribue à des résumés spécialisés et effectue des analyses d'information. Il est prévu de construire un système expert prototype sur l'identification des maladies de l'arachide (Arachis hypogaea), et leur maîtrise ainsi que les objectifs d'un tel système sont présentés. Le SATCRIS a créé une banque de données spécialisées sur le problème de l'aflatoxine de l'arachide et prévoit de sensibiliser les usagers d'information en Afrique sur ses ressources et ses services grâce à la participation à des ateliers régionaux.

The importance of information in research and developmental activities cannot be over emphasized. ICRISAT, since its inception, has endeavored to enhance its information resources and information handling capabilities not just to keep its scientists abreast of the latest developments in their fields of interest but also

to satisfy information requirements of many others who are working on its mandate crops in areas where information resources are either nonexistent or meager. ICRISAT established a specialized information center, the Sorghum and Millets Information Center (SMIC), in 1976 as a part of its Library and Docu-

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mentation Services to collect, collate, and disseminate information on sorghum and millets. The financial support to this project was partially provided by the International Development Research Centre (IDRC), Canada. Information products and services of SMIC included comprehensive bibliographies, Selective Dissemination of Information (SDI) service, literature search service, information analysis service, and document delivery service. It also published the *SMIC Newsletter* in English and French to provide current information to researchers. A worldwide directory of sorghum and millets research workers was compiled and distributed.

SMIC was replaced by a new project, the Semi-Arid Tropical Crops Information Service (SATCRIS), in November 1986 to expand information resources, products, and services of SMIC to cover all five crops of ICRISAT's mandate. The financial support to this project was provided in part by IDRC. SATCRIS laid emphasis on the exploitation of machine-readable products of global database producers such as the CAB International (CABI) and the Food and Agriculture Organization of the United Nations (FAO) to build a comprehensive inhouse database and to provide information services. An important goal of SATCRIS was to strengthen information handling capabilities of the ICRISAT Sahelian Center (ISC).

Phase I of this project ended in 1989 and a second phase was begun in 1990. IDRC has agreed to support the project in its second phase also. SATCRIS will continue to provide the information services started in the first phase and will make entry into newer areas of information that have potential for greater impact on users.

Objectives of SATCRIS (Phase II)

The broad objective of this phase is to build upon the strengths of Phase I by incorporating fresh components that will enable SATCRIS to provide new products and services to the National Agricultural Research Systems (NARS).

The specific objectives are:

- Expansion of the SATCRIS database to reflect the interdisciplinary nature of current SAT crops research;
- Development of time series datasets on the production and yield of crops of interest to SAT countries;
- Creation of an expert system on groundnut disease identification and control;

- Development of an user-friendly front-end to the SATCRIS database;
- Distribution of subsets of the SATCRIS database to NARS libraries and information centers in the SAT;
- Introduction of cost recovery charges for SATCRIS services from selected user groups;
- Continuation of the promotional work in Africa begun in phase I; and
- Enhancement of the information handling capabilities of ISC in Niamey.

Beneficiaries of the Project

The prime beneficiaries of the SATCRIS information products and services are ICRISAT scientists and researchers working at Patancheru, India; Niamey, Niger; Nairobi, Kenya; Lilongwe, Malawi; Bamako, Mali; Bulawayo, Zimbabwe; Aleppo, Syria; and El Batan, Mexico. Scientists, extension workers, academics, postgraduate students and research scholars working on the ICRISAT mandate crops in the NARSs of the SAT can also use SATCRIS services on request. Libraries and information centers can receive subsets of the SATCRIS database and/or training in the utilization of such subsets using Micro CDS/ISIS, a public-domain software.

Information Resource

SATCRIS database

The central resource of SATCRIS is its database, developed by obtaining monthly subsets of the CABI and Systems international d'information pour les sciences et la technologie agricoles (AGRIS) databases in machine-readable form. The data from these databases has been integrated with locally generated input to create a single, multi-disciplinary database on all five ICRISAT mandate crops. This database has been created with the help of a software package called BASIS. An inhouse-developed computer program is used for restructuring and conversion of data obtained from CABI and AGRIS before downloading them to the SATCRIS database (Fig. 1).

The SATCRIS database is built with inputs from predominantly agricultural databases. It is, therefore, lacking in coverage of data from interdisciplinary areas, such as food and nutrition, or biotechnology, which are not covered adequately in agricultural databases.

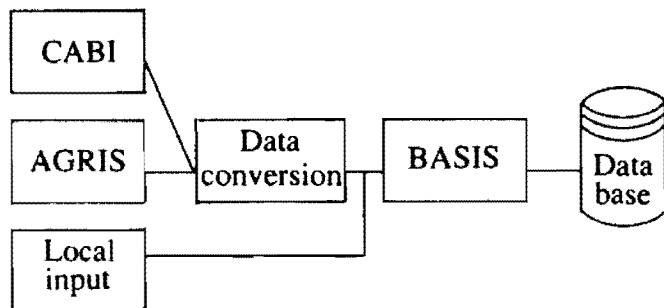


Figure 1. Semi-Arid Tropical Crop Information Service (SATCRIS) Database.

To fill these gaps in the SATCRIS database, it is planned, in the second phase of the project, to acquire and load data from such specialized databases as Food Science and Technology Abstracts (FSTA) and Biosciences Information Service (BIOSIS). Such a step would enable the SATCRIS database to be more comprehensive and provide wider and easier access to information relevant to the mandate crops not only from an agricultural science perspective but also from a broader phenomenological and life science perspective.

In the second phase of SATCRIS, it is proposed to develop a database containing time-series data on the production, yield, and distribution of crops of interest to the SAT countries. The idea is to develop such a database using traditional sources of statistical data as well as other sources such as journal articles and country reports. The possibility of using data from existing machine-readable sources (e.g., FAO, World Bank) will also be examined.

Databases on CD-ROM

SATCRIS often receives requests for search of information on crops and phenomena that are not covered by its own database. To satisfy such requests, SATCRIS uses the AGRICOLA (Agricultural OnLine Access) database of the U.S. National Agricultural Library (NAL), and the AGRIS database of FAO on CD-ROM (Compact Disc-Read Only Memory).

SATCRIS also has access to the Pesticide CD-ROM compiled by the Royal Society of Chemistry, UK, containing four databases. These databases provide quick access to pesticide products available worldwide, their active ingredients, structure, properties, and manufacturers. It is proposed to add the Dissertation Abstracts International (DAI) database on CD-ROM in the second phase of SATCRIS.

Information Products and Services

The following output products and services are provided:

- Monthly SDI service to researchers on request;
- On-demand literature search output;
- Abstracts service on all five crops in collaboration with CABI;
- Information analysis products such as literature reviews; and
- Document delivery service.

In addition to these products and services, it is envisaged to include the following services and products in the second phase:

- Distribution of subsets of the SATCRIS database suitable for use with Micro CDS/ISIS; and
- A prototype expert advisory system on groundnut disease identification and control.

SDI service

This is an automated current awareness service designed to regularly alert scientists to current literature that has a high probability of usefulness to them. This service uses current machine-readable data received each month from the CABI and AGRIS databases. These data are matched against users interest profiles, which are also stored as a computer file. The SDI service thus disseminates information to meet specific individual needs and interests. Furthermore, the service has built-in feedback that is regularly analyzed to ensure that SDI outputs continue to meet user needs and changing interests (Fig. 2).

Information search services

Requests for information that may be required in research project planning, problem solving, or decision-making are responded to by searching the SATCRIS database. The search output is provided free in the form of a list of references with abstracts wherever possible. Where the SATCRIS database is not adequate in meeting information requests, other databases available on line, from vendor systems [e.g., Dialog, Bibliographic Retrieval System (BRS), etc.] are searched. The cost of such searches, however, is charged to the client. SATCRIS also uses the

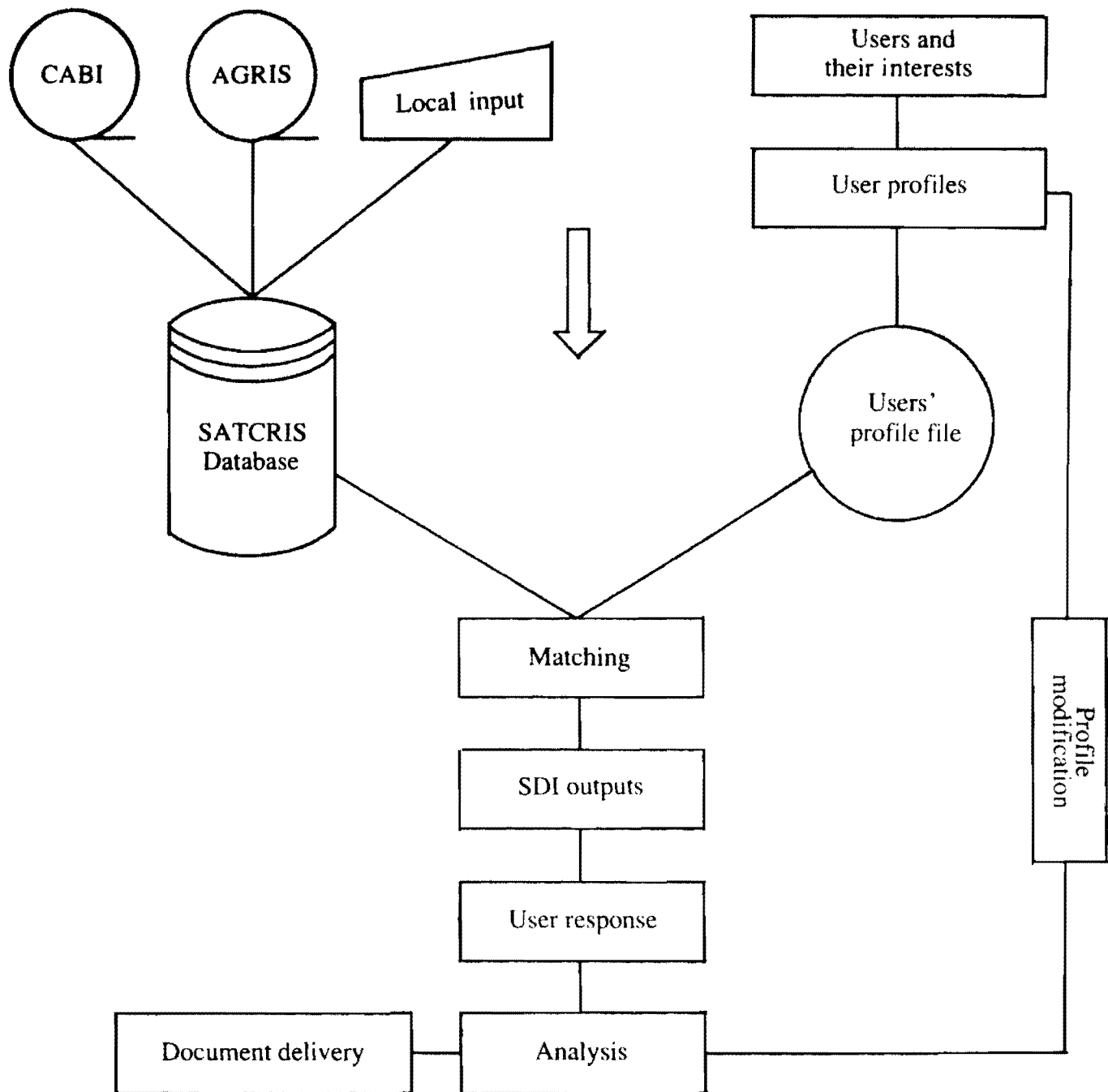


Figure 2. Selective dissemination of information (SDI) functional flowchart.

AGRICOLA and AGRIS databases on CD-ROM to respond to search requests.

Specialist abstracts service

SATCRIS collaborates with CABI to produce three specialist abstracts journals covering the five mandate crops: *Sorghum and Millets Abstracts*; *Chickpea and*

Pigeonpea Prompts; and *Groundnut Prompts*.

These abstract journals are published by CABI and are mailed free to selected individuals and institutions all over the semi-arid tropics. SATCRIS staff provide to CABI input of information about ICRISAT's five mandate crops generated in ICRISAT and from other selected sources. *Sorghum and Millets Abstracts* commenced publication in 1987, and the other two journals in 1988.

Information analysis service

SATCRIS collaborates with scientists to produce special-subject reviews and critical evaluations of the literature on specific topics. SATCRIS information specialists interact with the scientists to understand and delineate the subject area concerned. In choosing subject areas or topics, the emphasis is on the usefulness of the repackaged information to scientists, researchers, and others in the SAT, since they do not have benefit of regular interaction with the expertise available in a center such as ICRISAT. The information analysis products are written by subject specialists whose services are contracted for a few weeks to several months depending upon the nature and scope of the subject. SATCRIS staff conduct a comprehensive search of relevant literature, and original documents identified as useful by the scientists are provided for their use. These products are later edited and published for use by all interested scientists.

Document delivery service

The SATCRIS SDI service and information search services generate requests for photocopies of original articles from researchers all over the world. SATCRIS provides single copies of documents in its collection, on demand. In addition, SATCRIS uses national and international libraries, depositories, and documentation and information centers in order to fulfill requests for the originals of documents on all the five mandate crops.

Database distribution

It is proposed in the second phase of SATCRIS to develop procedures to enable subsets of the database to be downloaded into a Micro CDS/ISIS database that can then be offered to NARS institutions. The subsets will be on specific topical areas, such as aflatoxin contamination of groundnuts, and striga, and could also be created on demand. The recipients of these subsets will mainly be libraries, but these subsets could also be made available to those scientists who have no access to library facilities.

Expert advisory system development on groundnut diseases

It is proposed to build, in the second phase of the project, a prototype expert advisory system on

groundnut disease identification and control using an appropriate shell software package. It will identify appropriate crop management strategies and technologies to control and prevent spread or outbreaks of groundnut diseases. Diagnosis, recommendations, and alternative strategies will be presented to the user with explanations, illustrations, and an opportunity to record the user's reaction and provide feedback on field conditions. The system will generate a diary of past consultations and recommendations made for users, and monitor system performance and problem incidence for both NARS and ICRISAT.

SATCRIS Input to CABI and AGRIS Databases

SATCRIS is a user of CABI and AGRIS databases. It is, therefore, in the interest of SATCRIS to contribute to these databases. SATCRIS inputs ICRISAT-generated conventional and nonconventional literature to both AGRIS and CABI.

Specialized Databases on Microcomputer

SATCRIS is actively involved in the development of specialized databases for decentralized use on microcomputers. The idea is that SATCRIS will create and maintain such databases and make them available to the national and regional centers in the SAT. SATCRIS will keep these databases up-to-date and provide database updates on diskettes to users. In addition, SATCRIS will offer users training in the use of these databases, if required.

Two specialized databases already developed are: Aflatoxin problem in groundnuts, and *Busseola fusca* (a cereal stem borer). Information on a variety of primary documents, both conventional and nonconventional has been input to these databases. Micro CDS/ISIS has been used to create and maintain the databases.

The database on the aflatoxin problem in groundnut contains references of literature published during the last 30 years. Each record is provided with an abstract of the original article and a set of relevant keywords to facilitate search operation. This database has been created in response to the recommendations made in the International Workshop on Aflatoxin Contamination of Groundnut held at ICRISAT in October 1987.

Information Activities in Africa

SATCRIS operations are concentrated at ICRISAT Center at Patancheru, India. However, a subcenter of SATCRIS functions exists at ISC in Niamey, Niger. The subcenter has a documentalist who uses the infrastructure and facilities of the ISC and its library. The subcenter provides reference, retrieval, and document delivery services. The document delivery services are based on the collection of the ISC library and on a microfiche collection of primary literature useful to West African research on the five crops. The microfiche collection at ISC steadily expands with input from ICRISAT Center in India and consists of both conventional and nonconventional literature carefully chosen for its usefulness in the context of research in West Africa. Recently ISC has installed the SESAME database produced by the Centre de coopération internationale en recherche agronomique pour le développement (CIRAD), France. It provides access to more than 50 000 French agricultural literature references.

SATCRIS has conducted traveling workshops in eastern and southern Africa with the following aims:

- To improve awareness of scientists and other users to resources, services, and capabilities of SATCRIS;
- To build contacts with libraries and documentation centers to develop and improve exchange relationships; and
- To identify sources of conventional and nonconventional literature, and to explore formal and informal channels for ensuring the regular capture of such literature for the SATCRIS database.

During the second phase, it is proposed that SATCRIS will participate in regional workshops organized by ICRISAT for NARS scientists on sorghum, pearl millet, and groundnut with a view to make end-users better aware of SATCRIS resources and services.