NEW HORIZONS IN AGRICULTURAL INFORMATION MANAGEMENT

PROCEEDINGS

OF AN INTERNATIONAL SYMPOSIUM

MARCH 13-16, 1991

BEIJING, CHINA
The International Development Research Centre is a public corporation created by the Parliament of Canada in 1970 to support research designed to adapt science and technology to the needs of developing countries. The Centre's activity is concentrated in six sectors: agriculture, food and nutrition sciences; health sciences; information sciences; social sciences; earth and engineering sciences; and communications. IDRC is financed solely by the Parliament of Canada; its policies, however, are set by an international Board of Governors. The Centre's headquarters are in Ottawa, Canada. Regional offices are located in Africa, Asia, Latin America, and the Middle East.

Le Centre de recherches pour le développement international, société publique créée en 1970 par une loi du Parlement canadien, a pour mission d'appuyer des recherches visant à adapter la science et la technologie aux besoins des pays en développement; il concentre son activité dans six secteurs: agriculture, alimentation et nutrition; information; santé; sciences sociales; sciences de la terre et du génie et communications. Le CRDI est financé entièrement par le Parlement canadien, mais c'est un Conseil des gouverneurs international qui en détermine l'orientation et les politiques. Etabli à Ottawa (Canada), il a des bureaux régionaux en Afrique, en Asie, en Amérique latine et au Moyen-Orient.

El Centro Internacional de Investigaciones para el Desarrollo es una corporación pública creada en 1970 por el Parlamento de Canadá con el objeto de apoyar la investigación destinada a adaptar la ciencia y la tecnología a las necesidades de los países en desarrollo. Su actividad se concentra en seis sectores: ciencias agrícolas, alimentos y nutrición; ciencias de la salud; ciencias de la información; ciencias sociales; ciencias de la tierra e ingeniería; y comunicaciones. El Centro es financiado exclusivamente por el Parlamento de Canadá; sin embargo, sus políticas son trazadas por un Consejo de Gobernadores de carácter internacional. La sede del Centro está en Ottawa, Canadá, y sus oficinas regionales en América Latina, Africa, Asia y el Medio Oriente.

This series includes meeting documents, internal reports, and preliminary technical documents that may later form the basis of a formal publication. A Manuscript Report is given a small distribution to a highly specialized audience.

La présente série est réservée aux documents issus de colloques, aux rapports internes et aux documents techniques susceptibles d'être publiés plus tard dans une série de publications plus soignées. D'un tirage restreint, le rapport manuscrit est destiné à un public très spécialisé.

Esta serie incluye ponencias de reuniones, informes internos y documentos técnicos que pueden posteriormente conformar la base de una publicación formal. El informe recibe distribución limitada entre una audiencia altamente especializada.
New Horizons in Agricultural Information Management

Proceedings of an International Symposium,
March 13-16, 1991, Beijing, China

Compiled and Edited by
Gary K. McConne
Sponsored by

International Development Research Centre

Organized by

Scientech Documentation and Information Centre
Chinese Academy of Agricultural Sciences

Organizing Committee

Main Organizing Committee

Chairman  WANG Xianfu
Vice Chairman  JIAO Bin
HAN Ling
JIA Shangang
HUANG Xuegao
GUO Dianrui
ZHAO Huaying
PAN Shuchun
LI Kaiyang

Secretary  MIAO Zhuoran
Members  ZHAO Huaying

Secretariat

Chairman  MIAO Zhuoran
Members  CHEN Junying
HAN Ling
JIA Shangang
HU Jia
YU Fenghui
TAI Weidong
FANG Baoqin

Accommodation & Transport

Chairman  HUANG Xuegao
Members  ZHAO Huaying
QIN Juanjuan

Conference Site

Chairman  HE Chunpei
Members  PAN Shuchun
ZHANG Rongchang

Papers

Chairman  JIA Shangang
Members  LI Kaiyang
LIANG Suzhen
WANG Zhenjiang
GUO Jian

Material contained in this report is produced as submitted and has not been subjected to peer review or editing by IDRC Communications Division staff. Unless otherwise stated, copyright for material in this report is held by the authors. Mention of proprietary names does not constitute endorsement of the product and is given only for information.
Table of Contents

Foreword .......................................................... viii

Keynote Address

Problems, Issues, and Challenges for Agricultural Information Systems and Services in the Developing World
L. J. HARAVU ......................................................... 1

Session I: Management and Development of National Agro-Information Systems

Database Design at ICRISAT and the Experience of Using External Databases
L. J. HARAVU ......................................................... 13
Implementation Results, Roles and Effects of the Chinese Agricultural Information Services Project
WANG Xianfu ......................................................... 24
The AGRIS System and the Participation of China
Helga SCHMID ....................................................... 32
Ten Years’ Progress in China’s Computerized Information Retrieval and Its Future (Abridged)
ZENG Minzu ......................................................... 40
A Brief Introduction to the Computerized Agricultural Information Retrieval Systems in China
Chunpei HE ......................................................... 47
Efficient Architecture and Development Strategy of Agricultural Information Systems in Developing Countries
CHEN Qiben ......................................................... 54

Session II: Information Management and New Technology Application

The Infusion of Quality in Agricultural Information Services
Syed Salim AGHA ................................................... 58
Access Points to the Database of Bibliographies of Agricultural Documents in China and Their Retrieval Functions
WU Zeyi ............................................................ 64
Management of the AGRIS and CARIS Regional Centers in Southeast Asia
Josephine C. SISON ................................................ 75
Preliminary Study on the Microcomputer-aided System for Compiling an Agricultural Thesaurus and the Establishment of a Descriptor Database Management System
FANG Luming and WANG Caihua ................................. 85
Digitized Image Transmission Using High Speed Telecommunications Networks
   Gary K. MCCONE .......................................................... 92
The Integrated System of Database Creation and Computer-based Editing
   and Composition
   WANG Huaihui .............................................................. 98
Expert Systems for Agricultural Use: Recent Developments and Applications
   A. Mangstl and V. Troll .................................................. 103
A Study of the Khonkaen University Research Information System
   Daruna SOMBOONKUN ..................................................... 114
Establishment of the Chinese Agriculture Abstracts Database
   GUO Jian ................................................................. 120
On the CAB Thesaurus
   HOU Hanqing and XU Jia ............................................... 125
Realization and Application of Large Capacity Chinese Character Disk
   Operating System (LCCDOS)
   NIU Zhan Liang, BAI Juping and LIU Huifang .......................... 134
The Close Associations between Indexing and Microcomputer Software
   Maintenance
   BI Jinping .............................................................. 140
Program for Automatic Creation of Subject Indexes by Computer
   WANG Huaihui .......................................................... 145

Session III: Management and Development of Regional
Agro-Information Systems

SEAWIC: Its Organization, Objectives and Activities
   Ruben C. UMALY and Soetitah SOEDOJO ................................ 152
Strengthening the Establishment of a Chinese Regional Monographic
Agricultural Document Database
   YAN Ming-zhi, LU Ping and MA Tao .................................. 162
Indonesian Plan for an Integrated Management Information System for
Agricultural Research and Development
   Prabowo TJITROPRANOTO and Liannie K. DAYWIN .................... 169
Creation of an Information Database and a Developmental line of Agro-
Information Retrieval Techniques in Northeast China
   ZHENG Yegang and XIN Huajun ....................................... 173
Cybernetic Analysis of Scientific Information Services for Agricultural
Development in China
   CHENG Xiaolan and CAI Jianfeng ..................................... 178
Functioning of the National Agricultural Information Network (AGRINET)
   D.Y. RATNAVIBHUSHENA ............................................. 190
Agricultural Information Services of Hupei Province
   LI Zezhou .............................................................. 200
Some Ideas on the Tendencies of Information Services by the Regional Information Agencies of Agricultural Science and Technology  
PU Yunfeng and LI Pushen .................................................. 205
Ideas on Effective Ways of Transforming Agro-Information into a Productive Force  
SUN Tianshi and XUE Yajie .................................................. 213
Present Situation and Strategy of Development in Information for Agricultural Science and Technology in the East China Administrative Area  
CHEN Dingru ................................................................. 218
Coordination of Information Work on Agricultural Literature in Northwestern China  
MA Yingcai and ZHENG An ................................................. 224
Discussion on Elementary Assignment on Information of Agricultural Sciences and Technology at the Provincial Level  
MA Yikang and ZHOU Guangheng ........................................ 231
A New Domain of Agricultural Information Service at the Provincial Level  
-- The Combination of Information Analysis and Database Building  
YUAN Zhiqing ................................................................. 237

Session IV: Scientech Information and Productivity

The System of the PCARRD Applied Communication Division in Transferring Agricultural Technology to Farmers  
Teresa H. STUART .................................................................. 242
Discussion on Functions of Agricultural Scientific and Technical Information in the Development of a Rural Commodity Economy  
BAI Erdian, CHEN Enping and GAN Jintian ............................. 257
Information as an Economic Resource in Agricultural Development  
T. H. TAY ............................................................................. 266
Scientific and Technological Information is a Potential Productive Force  
ZHU Binlong ....................................................................... 274
Integrated Root Crop Program (Philippines): A Coordinated Approach in Research Development and Extension  
Perfecto U. BARTOLINI ..................................................... 279
Farm Management Data for Thai Farmers  
Mrs. Kanitha SOPANON ..................................................... 290
On Effective Ways for Information Research to Serve the Rural Economy  
CHEN Ming ....................................................................... 292
Preliminary Study on Ways of Transforming Agricultural Science Information into Productive Forces  
CHEN Qi Rong .................................................................... 298
Studies on Agricultural Information Research for the Development of a Rural Commodity Economy  
LI Wenmao and NIE Shangqi .............................................. 305
Joining the Main Front for Economic Construction to Open Up a New
Aspect of Information Research
SUN Xuequan and LIU Qingshui .................................................. 314
Establishing a New System of Agricultural Information Technology, Production
and Marketing, and Promoting the Agricultural Technological Development of
China
TONG Dijuan ................................................................. 319
On the Transformation of Agricultural Scientific and Technical
Information -- Thoughts on Transforming Information into a Productive Force
YUAN Weimin ............................................................... 325
An Effective Way for Transforming Scientific Information into Productive Forces
LI Lunliang and YU Ying ..................................................... 331
Broadening the Media of Communication of Agricultural Information and Its
Role in Agricultural Development
LIU Shixing, LI Cuie and GONG Junjie ...................................... 334

Session V: Development and Utilization of Agro-Information
Resources

A New Approach to Information Systems Management at the International
Potato Center (CIP): The Case of Information Services for National Potato and
Sweet Potato Programs
Carmen SIRI ......................................................... 340
Preparing English Abstracts of Chinese Documents -- an Important Step
Toward International Sharing of Chinese Information Resources
LI Kaiyang ............................................................... 351
Linking Information Resources Sharing Management and Library Training
in the South Pacific
Esther W. WILLIAMS .................................................... 354
Resources of Chinese Agricultural Documents and Their International Exchange
ZHANG Haoying .......................................................... 369
Developmental Status and Trends of the Retrieval Journal System for
Agricultural Information in China
JIA Shangang ............................................................. 377
Exploitation and Utilization of Sericultural Information Resources in China
GAO Zhicheng and CHEN Xichao ........................................ 385
The Agricultural Information Users in China and Changes in their Requirements
PAN Shuchun ............................................................. 390
BIOSIS as an Agricultural Information Resource
E. HODAS, M. O'HEARN and M. KELLY .................................. 398
On the Exploitation and Utilization of Agricultural Scientech Information
DING Jincheng ............................................................ 406
Exploitation and Effective Use of Scientific and Technological Information on
Agriculture
LIU Yixian ............................................................. 410
On Information Obstruction
YOU Xiu-Ling ......................................................... 415
Prospects for the Chinese Agro-library and Information Education
XUE Zihua ................................................................ 423
A Database of Bamboo Abstracts
ZHU S. L. and ZHANG X. P. ........................................ 429
Multi Level Services for User Needs in Agriculture
XING Zhiyi .................................................................. 435
Results and Benefits from an IDRC-supported Project: Tea Information
Services (China)
CHEN Zongmao, WANG Zipei and LU Zhenhui ................. 440
Practice and Enlightenment in Collection Development
CHEN Aifen .................................................................. 446

Appendix 1: Supporting Papers

Opening Address
WANG Xianfu .............................................................. 451
Welcoming Address
LIANG Keyong ............................................................. 452
Welcoming Address
Clive David WING ...................................................... 454
Welcoming Address
WANG Tingjiong .......................................................... 455
Discussion ....................................................................... 457
Summary Report of the International Symposium on New Horizons in
Agricultural Information Management .................................. 459

Appendix 2: Symposium Participants

List of Symposium Participants ........................................ 466

Appendix 3: Author Index

Author Index .................................................................. 472
Establishment of the Chinese Agriculture Abstracts Database

GUO Jian

Scientech Documentation and Information Centre
Chinese Academy of Agricultural Sciences
Beijing, China

Abstract
This article describes the procedure of establishing the database of Chinese Agriculture Abstracts with MINISIS software on minicomputer and Micro CDS/ISIS software on microcomputer, including a connected sequence of building the database, typesetting the journal publication, and producing the subject index by computer.

I. Information Source

Chinese Agriculture Abstracts (CAA) is a set of journals which publish comprehensive abstracts in agriculture. The publication of these journals was started in 1980 by the Scientech Documentation and Information Centre of the Chinese Academy of Agricultural Sciences. These journals are bimonthly and provide about 11,000 abstracts, including a subject index at the end of each year. It includes six individual journals: Soil and Fertilizer, Veterinary Medicine, Animal Science, Horticulture, Plant Protection, and Grain and Economic Crops. At present, about 1,000 different periodicals are available for abstracting by the editorial board. Of these, 400 are considered to be key periodicals. CAA concentrates on collecting and reporting the literature and documents of agriculture as well as those that are closely related to agriculture in our country. The abstracts are made from articles in periodicals, journals, trade magazines, monographs, conference proceedings, etc. The statistics show that articles from periodicals, trade magazines and journals are the main source of information.

II. The Main Concept of the Database

The computerized database of CAA is a Chinese character abstracts database built on an HP 3000/70 computer with MINISIS DBMS (the software was kindly provided by IDRC). The Database of Chinese Agriculture Abstracts (DB CAA) is in fact a comprehensive computerized information processing system which possesses the capabilities of compiling indexes and database retrieval.

The establishment of DB CAA began in 1988. At the beginning, we directly input the data on an HP 3000/37 computer, also all the data were saved in the HP 3000/37 computer every day. After working in this way for a period of time, we found that the input speed of the Chinese characters was slow, the computer system’s expense was high and that Chinese character processing in personal computers had improved.
Because of a personal computer’s fast input speed, simple operation and convenient management, we determined to switch to using a personal computer as the input device.

The DBMS software we used in the personal computer to build the database is Micro CDS/ISIS which was developed by UNESCO. It allows us to build and manage structured non-numerical databases. Its functions are similar to and compatible with MINISIS software. It provides a number of functions for the establishment of a database: definition, modification, input and output, etc. On the basis of such conditions, we have developed a flowchart of the system. Figure 1 shows the flowchart of the operation of this system.

![Flowchart Diagram of DB CAA](image-url)
III. Realization Of The Establishment Of DB CAA

Each record of the DB CAA is designed to include 25 fields. These fields include the contents of the abstracts. It is searched by classification number, author, keywords in title, descriptors and feed terms. During retrieval, users can set up Boolean expressions including "logical OR, logical AND, logical NOT, left-truncation and right-truncation" to retrieve information from the database.

During the building of DB CAA, we wrote a program which can assign abstract numbers by computer according to the classification number of each record. In this way, we can not only reduce the work burden of editors, but also avoid errors. This skill is a simple one. See Figure 2.

```
DB Records
   | Sort on Classification Number
   | ISO 2709 Format Data
   | Assigning Abstract Number
   | ISO 2709 Format Data
   | Loading Database
   | New DB Records
```

Figure 2. Flowchart Diagram on Assigning Abstract Number by Computer

Because of the complex structure of the database when using Micro CDS/ISIS software, we avoid calling database records directly. But we can call ISO-2709 formatted data as intermediate forms. It is a text file and easy to process. After having abstract numbers assigned by the program, the ISO-2709 format file becomes a new file which includes abstract numbers. It forms a new sequence of records in the database after the file is loaded into the master file in the minicomputer.

As subsidiary products, we also typeset the abstracts journal during the creation of DB CAA. We use the data from the database records to typeset the journal publication so as to avoid unnecessary repetition in data inputting. There are two kinds of typesetting software available in our country. One kind of software is used for Office Automation (OA), but it is not suitable for printing journals. Another kind of software is fit for
publishing. It includes batch processing, alternative type fonts and combinations of type. The software we chose is "KeYin" which is batch processing software. The procedure for typesetting the journals is described briefly as follows:

Using a formatting language with Micro CDS/ISIS software, we insert the functional symbols of typesetting software in the output file, e.g., size of the printed character, form of the printed character. After a file to be edited is produced by Micro CDS/ISIS, we artificially interpose some characters which are not inputted during data input, such as symbols of molecular formulae. When the file has been edited, the computer is used to automatically typeset the file and a typeset file is produced. At last, the typeset file is printed by HP LaserJet II printer. We produce a subject index of each abstract journal at the end of each year. Now the Chinese characters are classified into two levels. The first level is sorted according to phoneticism. The second level is sorted according to the basic structure of the Chinese characters, such as strokes, etc. Because of this, the output index file is not fit for publishing. We use the thesaurus management program of MINISIS software to solve this problem. Both first and second level Chinese characters (a total set of 6,763 Chinese characters) and other character symbols are sorted according to the sequence of the XinHua Dictionary. We then rebuild a new index comparison table on MINISIS. During sorting, the new table is used to replace the original table. Thus, we have basically solved the issue of sorting Chinese characters.

At present, the content of the database includes the following disciplines (corresponding to the printed abstract journals): soil and fertilizer, veterinary medicine, animal science, horticulture, plant protection, grain and economic crops. Through our efforts, DB CAA now contains about 5,400 records. We estimate that DB CAA will reach about 14,000 records at the end of this year.

IV. Problems

We have encountered many problems during the past two years. Some have been solved, others remain unsolved. The first problem is the shortage of Chinese characters in the computer. About sixty Chinese characters are missing in the DB CAA which has been loaded into HP 3000/70 computer. The second problem is the excessive artificial interpositions in the original typeset file during editing (on the basis of the contents of the abstract). The second problem refers mainly to symbols of molecular formulae and the italics of the Latin alphabet which the computer can hardly determine because they are in the text of the abstracts. The last problem is how to index a Chinese character which has multiple phoneticism. In a computer, the sequence of the phoneticism of a Chinese character is one-to-one. The computer can't determine how to phoneticize a character. These problems may be solved later when new software is available.

V. Conclusions

The establishment of the Database of Chinese Agriculture Abstracts has great significance because it is the first Chinese character agriculture abstract database in our country. We provide retrieval services while building this database. Users and readers
are welcome to query and test DB CAA. In so doing, we can promote both our work and the development of agriculture in China.