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

<table>
<thead>
<tr>
<th>Role</th>
<th>Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chairman</td>
<td>WANG Xianfu</td>
</tr>
<tr>
<td>Vice Chairman</td>
<td>JIAO Bin</td>
</tr>
<tr>
<td>Secretary</td>
<td>HE Chunpei</td>
</tr>
<tr>
<td>Members</td>
<td>MIAO Zhuoran</td>
</tr>
<tr>
<td></td>
<td>HAN Ling</td>
</tr>
<tr>
<td></td>
<td>JIA Shangang</td>
</tr>
<tr>
<td></td>
<td>HUANG Xuegao</td>
</tr>
<tr>
<td></td>
<td>GUO Dianrui</td>
</tr>
<tr>
<td></td>
<td>ZHAO Huaying</td>
</tr>
<tr>
<td></td>
<td>PAN Shuchun</td>
</tr>
<tr>
<td></td>
<td>LI Kaiyang</td>
</tr>
</tbody>
</table>

Secretariat

<table>
<thead>
<tr>
<th>Role</th>
<th>Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chairman</td>
<td>MIAO Zhuoran</td>
</tr>
<tr>
<td>Members</td>
<td>CHEN Junying</td>
</tr>
<tr>
<td></td>
<td>HU Jia</td>
</tr>
<tr>
<td></td>
<td>YU Fenghui</td>
</tr>
<tr>
<td></td>
<td>TAI Weidong</td>
</tr>
<tr>
<td></td>
<td>FANG Baoqin</td>
</tr>
</tbody>
</table>

Accommodation & Transport

<table>
<thead>
<tr>
<th>Role</th>
<th>Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chairman</td>
<td>HUANG Xuegao</td>
</tr>
<tr>
<td>Members</td>
<td>ZHAO Huaying</td>
</tr>
<tr>
<td></td>
<td>QIN Juanjuan</td>
</tr>
</tbody>
</table>

Conference Site

<table>
<thead>
<tr>
<th>Role</th>
<th>Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chairman</td>
<td>HE Chunpei</td>
</tr>
<tr>
<td>Members</td>
<td>PAN Shuchun</td>
</tr>
<tr>
<td></td>
<td>ZHANG Rongchang</td>
</tr>
</tbody>
</table>

Papers

<table>
<thead>
<tr>
<th>Role</th>
<th>Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chairman</td>
<td>JIA Shangang</td>
</tr>
<tr>
<td>Members</td>
<td>LI Kaiyang</td>
</tr>
<tr>
<td></td>
<td>LIANG Suzhen</td>
</tr>
<tr>
<td></td>
<td>WANG Zhenjiang</td>
</tr>
<tr>
<td></td>
<td>GUO Jian</td>
</tr>
</tbody>
</table>
# 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. RATNAVI BHUSHENA .............................................. 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
ZHAO Huaying ........................................................................ 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
Appendix 1: Supporting Papers

Opening Address
WANG Xianfu .......................................................... 451
Welcoming Address
LIANG Keyong .......................................................... 452
Welcoming Address
Clive David WING ...................................................... 454
Discussion .............................................................. 457

Appendix 2: Symposium Participants

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

Appendix 3: Author Index

Author Index ................................................................ 472
On the Exploitation and Utilization of Agricultural Scientech Information

DING Jincheng

Institute of Scientech Information
Tianjin Academy of Agricultural Sciences
Tianjin, China

Abstract

In the course of the 'two changes' realized in China's agriculture, the information services of agricultural scientech have been appearing to be more and more important. The main contradiction between information collection and utilization must be solved in agri-scientech informational research. The regional information research unit of agri-scientech should address agricultural production in the local area. Its informational work is to pay particular attention to serve the specialized agricultural scientech household, so the service function of scientech information must be stressed further.

The exploitation and utilization of agri-scientech information, means to activate the information into actual techniques, and to transfer the actual techniques into productive forces. The "activating" and "transferring" are determined by the characteristics of farm production and the conditions of economic techniques in China. The information service should combine information collection and research with information exploitation and utilization, introduce this information work to commodity production fields in the countryside, implement rewarding services, promote the development of agricultural production, and attain the economic and social efficiency of information service, which is not only the starting point but also the end-result of agri-scientech information work.

I. Strengthen the Service Function

It is in an era when a revolution in new techniques is developing vigorously in the world, that China's agriculture is realizing the course of "two changes." The dependence of agricultural production on agri-scientech developments are appearing to be more and more and more necessary. So it is more and more important to do a good job in agri-scientech information service. The main contradiction throughout the process of agri-scientech information work lies between information collection and information utilization. And the key challenge is how to help the user utilize information. Therefore, the information service must adopt different methods to serve different targets and use various ways and methods to satisfy the user's basic needs for scientech information. So it is not only the starting point but also the end-result for an information service to establish and perfect a suitable information service system, to fully exert the work efficiency of scientech information personnel, to attain better information effects and economic benefit, to make a fruitful contribution to the economic construction in the countryside.
As the regional information research unit of agri-scientech should address the agricultural production of its local area, its information service should pay particular attention to the "specialized agricultural scientech household." The economic development of the countryside depends both on economic policy and on science and technology. The specialized agricultural scientech households are very interested in science, and require accurate scientech information. Supplying information services and scientech consultation for these specialized agri-scientech households will greatly promote the development of commodity production in rural areas and speed the realization of the "two changes." The transformation of information service will inevitably strengthen the function of scientech information services. The consulting function must move from its original reference nature to one of insurance; the former free service must transform into a fee-based service. Therefore, information service must be seen as a business with intelligent work as its capital. It can help the user seek the greatest economic efficiency, and assume the responsibility for the techniques and the economy, so it is reasonable to be paid a certain amount of money. Thus, the relationship between information personnel and users is not limited only to supply and demand, but also a new relationship has developed that combines information personnel and users under the overall aim of developing the economy of the countryside, and it is also the bridge to transfer agricultural scientech information into productive forces.

II. Activation and Transfer

Information service is one means to transfer scientech information into productive forces. The agricultural information service is an important medium that combines science and technology with agricultural production in order to raise agricultural productive forces and economic efficiency.

One of the objectives of exploitation and utilization of agri-scientech information is to activate the information into practical techniques, the other is to transfer the practical techniques into productive forces. The "activation" and "transfer" are decided by the characteristics of farm production and the conditions of economic techniques in the rural areas. First, the agricultural production cycle is long, and to a great extent, it is restricted by natural conditions. Second, the development of an agricultural economy is not balanced, the difference in productive conditions is very large, the peasants' scientific advancement is lower and the peasants lack the policy-making ability that they need to carry out commodity production; and third, at present the system for countryside commodity production is not perfect, and the information transmitting channel is not smooth. Under these circumstances, the key that the information services must find is how to transfer the scientech information into productive forces, and how to help the user make use of the information.

In the past few years, the information work in our institute has transferred from pure information collection and reporting to a multi-functional service of information collection--experimental digestion (activating)--technique training--technique consulting--directional service--commodity production. Which means that information collection and service have been combined with information exploitation and utiliza-
tion. The scientech information work has been directly introduced to commodity production fields in the countryside, implementing fee-based services, and attaining the economic and social efficiency of information service. This is the way of the future in information exploitation.

The transferring of agricultural scientech information should be divided into two steps: (1) Collecting the information and activating it rapidly into actual techniques. In the light of local conditions, potential scientech information was collected, then it was activated into actual techniques; (2) Transferring the actual technique into productive forces. By various methods of training, consulting and servicing, etc., to popularize the actual technique, the actual technique is mastered by the users (peasants), then it is used to develop commodity production, to heighten the economic and social efficiency. Activating and transferring makes up the main body of scientech information exploitation. It has been proven that it is an effective way for agricultural scientech information work to address economic construction in the countryside.

The information activating is decided by three factors: (1) The importance of the information for the agricultural production and development of the economy in local countryside, (2) The economic and social efficiency of exploitation of the information, (3) The possibility of information exploitation. For example, after thinking over these three factors, our institute decided on activating scientech information on an edible fungi, Ampullaria gigas Spix. Through experiment and practice, the newest practical techniques that are suited to planting and breeding in our city have been developed.

III. Exploitation and Utilization

Through information activation, we’ve developed practical techniques including interplanting of Pleurotus membranes in maize fields, Pleurotus ostreatus in apple orchards and growing of Pleurotus ostreatus in outdoor beds during the high temperature season. Interplanting P. membranes in maize fields has been successful, the output of the maize increased 15% and the P. membranes yielded 2300 kg, the rate of biological transformation is 115%, the net income per hectare increased 2,200 yuan. The fruit body yield per square meter of edible fungi grown in outdoor beds is 22 kg, the rate of biological transformation is 110%, the net income per square meter is 20 yuan. The successful practical technique of growing edible fungi in outdoor beds can omit the room cost, and make it possible to produce edible fungi during the hot season.

In order to speed the transformation, exploitation and use of activated information--practical technique, our institute has run nineteen training courses, and 1,089 peasants have been trained in two years. Once the students learned techniques to cultivate edible fungi, they all bought edible fungi seed and production materials from our institute and got better economic efficiency after they were put into operation. The yearly income of some of the students has reached over 20,000 yuan. According to statistics, the area planted in edible fungi in Tianjin municipality in 1988 was 33 thousand square meters, two times more than that in 1985, the edible fruit yield per year was over 500 thousand kg. The total output value reached over 1,000,000 yuan. Through information exploita-
tion, edible fungi production is now gradually forming a new industrial operation around our city.

On the basis of technical training, a cooperative network of edible fungi techniques has been established with our institute as the leading unit to provide technical consulting and supply edible fungi seed for over 750 members of the cooperative network. We also produce a bimonthly journal on edible fungi. It enables the edible fungi information service to have long-term, fixed goals.

Through the information feedback of the members of the cooperative network, our institute can understand and master problems existing in edible fungi production in rural areas, and forecast developing trends and prospects for the future. This circulation of information exploitation is pushing the development of the edible fungi industry in our city. By the exploitation and utilization of scientech information, the service function of agri-scientech information has been strengthened. In the past few years our institute has attained a net income of over 80 thousand yuan, through information activating, technique transferring, training courses, setting up cooperative services, providing edible fungi seed and technical consultation, etc. Implementing a fee-based information service may also promote the self-construction of our institute.