NEW HORIZONS IN AGRICULTURAL INFORMATION MANAGEMENT

PROCEEDINGS OF AN INTERNATIONAL SYMPOSIUM
MARCH 13-16, 1991
BEIJING, CHINA
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New Horizons in Agricultural Information Management

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

Compiled and Edited by
Gary K. McConle
Sponsored by
International Development Research Centre

Organized by
Scientech Documentation and Information Centre
Chinese Academy of Agricultural Sciences

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# 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. RATNAVLbishena ......................................................... 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
### 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
New Horizons in Agricultural Information Management

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

Appendix 2: Symposium Participants

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

Appendix 3: Author Index

Author Index .................................................................... 472
Preliminary Study on Ways of Transforming Agricultural Science Information into Productive Forces

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Abstract
In order to effectively transform information on the science and technology of agriculture into productive forces, we must develop five lines of service: namely services rendered for policy makers, for agricultural research, for agricultural production, and for importing technology, as well as establishing a mechanism to deal with scientific and technological information. The relation between scientific and technological information and productive forces is addressed separately in this article by citing five different examples of the application of information and suggesting that agricultural information activities should be strengthened in seven aspects.

The progress of scientific and technological information is a direct motive force for social development. The progress of modern information in science and technology promotes the coordinated development of technology, economy and society and the rapid renewal of man's knowledge and the technical products of man's knowledge. In developed countries, information activity has run the course of each social activity. Tremendous productive forces have been generated continuously by the close integration of resources of information, material and talent. The scientific and technological information service is one of the most important means to transform it into productive forces and a bridge for passing science and technology to society. In order to effectively transform scientific and technological information on agriculture into productive forces, five approaches must be developed.

I. Provide service to leaders for making policy decisions

There are close relations between the leaders' policy decisions and our country's economic well-being. If the policy decisions made by the leaders tallies with the actual local situation and that of our country and conforms to the requirements for the development of productive forces, they will promote the development of productive forces, otherwise, they will hinder the development.

Scientific policy decisions stem from accurate forecasts based on the analysis of a vast amount of valuable scientific information. Policy decisions will hardly be workable or successful if they are in conflict with available information. Therefore, methods to grasp
information determine policy decisions and directly influence the development of productive forces.

In recent years, the international economic industrial structure has been undergoing major adjustments and in view of the characteristics and current situation of the development of productive forces in the elementary stage of socialism in our country, the Central Committee of the party has put forward the strategic decision to develop externally-oriented agriculture in the open economic zones and the coastal port cities. It brings the economic superiority in coastal areas into full play and greatly promotes the growth of productive forces. The Macroscopic Agricultural Research Laboratory in the Fujian Academy of Agricultural Sciences provides timely reference materials such as investigative reports on the externally oriented agricultural base for the production of export commodities, thus providing a scientific basis for leaders to make policy decisions. According to information on the international market supply and demand and in accordance with an accurate market forecast and technological information on various aspects such as production, processing, storage, transportation, etc., Fujian Province has drafted a medium term and a long term development program, rationally arranged the distribution and scale of its production bases and confirmed the key products to be produced, thus ensuring the development of the externally-oriented type of agriculture. In 1988 the foreign-exchange-earning agriculture in the whole province achieved remarkable success. Its exports reached 458 million US dollars, i.e., an annual increase of 20.7% over that in 1987.

After obtaining economic and technological information on the demand of asparagus in the international market, Dongshang County, Fujian Province, took advantage of its local natural conditions to develop asparagus for export in a big way. In 1987 it put 1.2 thousand hectares into the production of asparagus and earned over 13 million US dollars. In 1989 it put 5 thousand hectares into asparagus production and an earning of 35 million US dollars is being estimated. This shows that correct policy decisions can promote the development of productive forces enormously.

On the other hand, if great attention is not paid to research information, it is possible to make incorrect policy decisions and sustain failures. "The Long Hair Rabbit Event," "The Cauliflower Event," "The Mushroom Event" and other unsuccessful endeavors should be kept in mind as profound lessons.

II. Provide service to science research

Science and technology are productive forces. In many countries, science and technology are held in high esteem. The development of science and technology is regarded as a key means to realize the strategic goal of a country's development. A current trend which is worth paying attention to is the intensified competition in the development of science and technology in the world. Information on science and technology is the basis of scientific research. It is a scaling ladder and a powerful instrument for scientific and technological development. We are aware that it is only through the extensive collection of information for making research and analysis, and its timely implementation in
order to make our science and technology plans and to develop the best research and production program that we shall be able to be successful in the international high technology market.

In order to speed up the development of science and technology, we must pay attention to collecting and sorting out information, advancing new questions and drawing new conclusions on the basis of achievements already gained by others. Nowhere is there any exception in the research work of agricultural science. Every phase of research work starting from the selection of the subject to its description, its implementation and its appraisal as well as its spread and application cannot be carried on without information at every stage.

In recent years, information on science and technology in agriculture has played an enormous role in agricultural research. For example, before setting up a new research subject and after obtaining "The Catalogue on the Subject of Hybrid Rice" supplied by the information office of the academy, the Department of research on Hybrid Rice in the Hunan Academy of Agricultural Science proceeded to collect a large amount of domestic and foreign research data on hybrid rice, thus promoting the process of research work greatly, and increasing the research benefits and making their theory on the basic research and production technology of hybrid rice lead the world. This achievement has spread widely throughout the whole country and achieved enormous social and economic benefits, and also energetically promoted the development of agricultural productive forces in our country. Many examples in each province of our country have proven that the work of science and technology information has made remarkable contributions in accomplishing more in scientific research, making achievements quickly, and transforming achievements into productive forces more quickly as well.

III. Provide service to agricultural production

Scientific and technological information work is the bridge and medium of connecting science and technology-production-trade in one chain. It has the stronger ability of coordination and organization by itself. It participates in the whole process of social material production while promoting the coordinated development between the economy and science and technology and between production and science and technology. It energetically raises the standard of management efficiency, labor productivity and economic benefits.

With the deepening of economic system reform and the implementation of the policy of opening up to the world and the stimulation of the economy, the economy of rural areas in our country is changing from a natural economy and a production economy to the track of a step-by-step planned commodity economy. Commodity production will lead to trade competition. Not only must we keep informed of all aspects of agricultural technology information but we must also pay attention to the development of the commodity information market and science and technology information on diversified
trade and comprehensive trade so as to promote the development of a commodity economy.

In accordance with domestic and foreign market demand, the Research Institute of Terrestrial Heat in the Fujian Academy of Agricultural Sciences brings the terrestrial heat superiority and technology strength now available in its own institute into full play, breeding tropical ornamental fish and growing species of indoor ornamental flowers. According to conditions of geography, climate and quality of seed resources in our province, the information office of this institute issues a series of valuable information such as "Domestic and Foreign Market Development of Tropical Ornamental Fish," "Species of Ornamental Fish Available for Breeding," "The Up-to-date Species of Indoor Ornamental Flowers in the World Market" as a reference for relevant researchers and corrected the trend of blindly importing low-grade tropical fish. At present, ornamental fish and the nursed seeds of ornamental flowers have been exported to Hong Kong. Ten thousand nursed ornamental flowering plants have been sold to eleven provinces and cities all over the country in one year. Enormous social and economic benefits have been achieved.

For another example, the information network set up jointly by Sannong (Namely: "Agricultural Science and Technology Information on Externally Oriented Agriculture," "Information on Agricultural Science and Technology," and "Information on Agriculture") provides information regularly to its grass-roots agricultural units. The level of agricultural technology in some grass-root units has raised greatly and promotes the development of agricultural production through the use of improved seeds and adopting new technology. Some grass-root units have improved their ability to earn foreign currency by exporting subsidiary agricultural products. For instance, after obtaining the information on "New Technology on High-yielding Corn," "The Application of Aspirin in Agricultural Production," and "Stembright Control of Asparagus," the Agricultural Committee in Fuchin County published the above relevant information in the county-run Agricultural Science and Technology and printed more than ten thousand copies for distribution, thus promoting the development of corn and asparagus production greatly. In 1988, the planting area of corn was enlarged in the whole county. The total output had increased by 78.3%. The output per mu was 163 kg, i.e., an increase of 51.3% over that in 1987. When they discovered the information contained in "Shortage of Peanut Supply and an Advance in Price in the World Market," Yinxixi County quickly contacted foreign merchants and produced salted crisp peanuts for export and exported twenty tons of peanuts in February 1989.

IV. Provide service for the importation of technology

In the world of today, every country is active in importing advanced technology to promote the economic development of its own country. It is important to develop productive forces on a new and higher plane through the introduction of new technology. The introduction of technology and improved seeds is a more difficult task. It usually involves the development and utilization of the market, power and resources. It needs relevant funding, talent, and technology, too. Therefore, before determining
which item to import, we must collect a large amount of accurate domestic and foreign information, investigate extensively and study carefully to explore its feasibility so as to ensure that the imported item is highly reliable and applicable. The success of importing advanced technology depends on making the correct importing plan drawn out of accurate information.

Meanwhile the Information Research Office of the Information Department of Fujian Academy of Agricultural Sciences is now collecting Taiwan's agricultural data. At the same time it pays attention to grasp both the recent information on agriculturally improved species of seeds and new technology for the timely reference of the agricultural units concerned. The Improved Seed Development Company of the Academy has successively imported more than 150 improved species of seeds such as sugarcane, rice, sweet potato, watermelon, asparagus, Chinese cabbage, green cauliflower and so on according to information on improved species of seeds and the information on marketing and trade for 21 counties and 32 units in Fujian. Among these improved seeds, "Xin Hong Bao" watermelon seedlings have been planted for trial and have been well received in nearly ten provinces and municipalities in our country. In 1987 the total amount of its planting area was 420 thousand hectares in the whole country, and production increased by 13-60%. It is estimated that its increased benefit amounts to more than 7,200 thousand yuan. On the basis of the above, the company cooperated with foreign merchants, imported and improved parental-maternal combinations for production and then re-exported them abroad to earn foreign currency in return.

For another example, before its establishment and during the course of production, the Fujian Mawei Aquatic Product and Feed Company, Ltd. collected information on the production, sale and marketing of prawn and prawn feed as well as information on numerous pieces of feed production equipment in the world through all channels including the Information Department of the Fujian Academy of Agricultural Sciences and decided to import semi-automatic feed production equipment at the 1970s technological level, and the most scientific production prescription of the 1980s. This is the result of taking into consideration both the level of feed production in our country and the research and analysis work done by the company. The preparatory work done by the company resulted in its achieving great success in digesting the imported technology and the national implementation of producing feed additives. Not only has it enlarged the supply of raw materials but has also reduced production costs and made the production price more competitive. Now its production has been thrown into the international market and the annual output has reached 20-odd thousand tons. The output value has reached over 100 million yuan. The annual profit is over 20 million yuan. However in the corresponding period, a certain aquatic production and feed company in Fujian province invested more but developed slowly due to blindly importing without paying attention to information research. Its annual output did not reach one tenth of that of Mawei Company. Consequently, the progressiveness of science and technology information is the basic requirement of importing technology. It is only by depending on its progressiveness that we can get twice the result of import benefits with half the effort.
V. Setting up an information--production--management entity

With the continuing deepening of the reform of economy, science, and technology systems, the place of information in science and technology will change fundamentally. One of the effective means of transforming information on science and technology into productive forces rapidly is to bring the work of information on science and technology into the fields of economic activities, to form a new information--production--management entity, to take the road of information--production--trade unity.

After obtaining accurate and applicable information on the basis of assessing, analyzing, and screening a great amount of information, the researchers of science and technology information must test it through the production--management entity and put science and technology directly into production. After having achieved obvious economic benefits and experiences of production, they should make it widely popularized and produce the various kinds of commodities demanded in the marketplace.

The Quan Zhou Science and Technology Demonstration Breeding Team set up cooperatively by the Quan Zhou Institute of Information on Science and Technology and breeding-specialized households is an attempt to promote the integration of technology information with the agricultural commodity economy's research, development, production and trade. Now it has offered information in kind to specialized breeding households—over 2,000 genuine young Beijing ducks and over 12,000 young hybrid Beijing ducks, and has incessantly undertaken to supply and pass on its technology information. At present, it has provided 13,000-odd Beijing ducks weighing 25,000-odd kgs to the market and enabled the transformation of information on science and technology into productive forces as quickly as possible.

Thus it can be seen that information on science and technology is a potential productive force. In an information society, the development of productive forces has close links with the grasp and application of information. Our service for this information is to activate knowledge into information first and then to transform information into productive forces. In order to transform information on science and technology into productive forces, we must put more strength in our work as follows:

1. Strengthen the attitude toward information. The attitude toward information must be strengthened on the part of the leaders, cadres, researchers and library information researchers. Information researchers should join the policy-making group and take part in discussing potential research subjects.

2. Strengthen the structure of information on agricultural science and technology and amplify the information network. We must extensively collect important documents about science and technology from different countries in the world, coordinate publications with information, unify planning and arrangements, promote the units which are responsible for doing information research, making reports, translating and rendering services.
3. Improve the basic quality of agriculture information researchers. First, information personnel must cultivate a firm view toward service and adopt a good attitude toward rendering services, gear up to society and go deep into the front line of scientific research and economic construction. Second, information specialists must have proficient service skills, must be particular about serving information researchers, must be proficient in their professional work, improve their ability to analyze, judge and summarize information continuously and be good at watching out for new developments and improve their ability to make predictions.

4. Make full use of oral and information in kind. In the course of their work on the international economy, foreign merchants and traders from Hong Kong and Taiwan and overseas Chinese traders are in possession of a great amount of information. We should pay full attention to that information and bring it into full play by talking with them or by using letters and telephones to obtain various categories of advanced applicable information.

5. Improve the means of information services. It is a task of great urgency to realize the modernization of information in science and technology. Every province and every district should lose no time in setting up the a Computer Search Service System so as to form a national network as early as possible. It is suggested that the Computer Information Policy-making Supporting System should be set up at the same time, which consists of a data bank, model pool, method base, knowledge base and management system so as to make the computer not only provide information in time, but also analyze and forecast.

6. Develop various advisory services to meet the needs of society. We should make full use of social strengths to organize a science and technology advisory service company and develop multi-level and multi-functional information services such as various information research services, marketing and technical training services, etc., in order to transform information into productive forces as early as possible.

7. Pay attention to the role of feedback. The feedback of information is the consequence about the application of information by consumers which reflects first the social and economic benefit produced by the work of information on science and technology and second, the requirements and opinions of agricultural consumers at various levels. This makes us continuously improve our methodology in rendering information services, acquiring more benefits, and promoting the transformation of information into productive forces.