

87011

Information
Sciences
Archival Copy

3-485-0233

NEW HORIZONS IN AGRICULTURAL INFORMATION MANAGEMENT

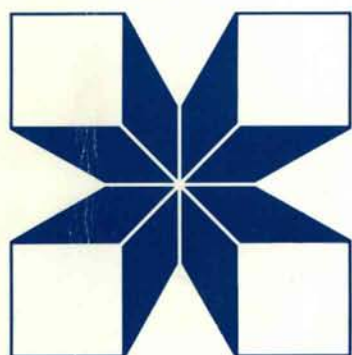
PROCEEDINGS

OF AN INTERNATIONAL SYMPOSIUM

MARCH 13-16, 1991

BEIJING, CHINA

IDRC
CRDI
CIID



C A N A D A

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. Établi 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, África, 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.

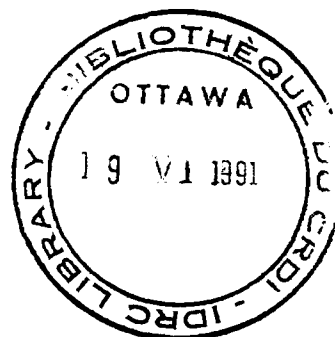
87011
PERIODICALS
PÉRIODIQUES

IDRC-MR293e
May 1991

New Horizons in Agricultural Information Management

Proceedings of an International Symposium,

March 13-16, 1991, Beijing, China



Compiled and Edited by

Gary K. McCone



ARCHIV
002:631(510)
N4
1991

Sponsored by

International Development Research Centre

Organized by

Sciencetech Documentation and Information Centre

Chinese Academy of Agricultural Sciences

Organizing Committee

Main Organizing Committee

| | |
|---------------|--------------|
| Chairman | WANG Xianfu |
| Vice Chairman | JIAO Bin |
| | HE Chunpei |
| Secretary | MIAO Zhuoran |
| Members | HAN Ling |
| | JIA Shangang |
| | HUANG Xuegao |
| | GUO Dianrui |
| | ZHAO Huaying |
| | PAN Shuchun |
| | LI Kaiyang |

Secretariat

| | |
|----------|--------------|
| Chairman | MIAO Zhuoran |
| Members | CHEN Junying |
| | 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 |

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 TJITROPANOTO 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: Sciencetech 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 Sciencetech 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 |
|--------------------|-----|

Establishing a New System of Agricultural Information Technology, Production and Marketing, and Promoting the Agricultural Technological Development of China

TONG Dijuan

*Institute of Sciencetech Information
Hebei Academy of Agricultural Sciences
Shijiazhuang, China*

Abstract

Aimed at characteristics of the new requirements of agricultural information users, the paper analyzes the scope of agricultural information service, addresses the mechanism of transforming agricultural information into productivity, and its relationships with other key factors. The paper also puts forward methods in which agricultural information is involved in the process of agricultural technological reform, the organic framework of grass-root information service, network construction, and views on a comprehensive information service.

With the rapid development of commodity production in rural areas in China, the farmer's production and management techniques are being greatly changed, from purely seeking a high yield to increasing their overall economic benefit. Being guided by the market, more and more agricultural products have been put into circulation. Farmers conscientiously use market law to adjust agricultural structure and promote agricultural development and technological progress. Throughout the course of production, farmers have taken great interest in information on the market, production techniques, agricultural materials, agricultural product processing, resource development, economic benefit, etc. The countryside has become a big market for agricultural information, and farmers have become the biggest users of agricultural information. With the constant development of agricultural productivity, the users' potential will be deeply and widely exploited.

I. All-Round Agricultural Information Service

Grass-roots units below the county level and even the farmholders themselves are the main body for transforming agricultural technological information into productivity. According to the characteristics of agricultural development, we should study effective ways and means of transforming agricultural information into productivity, thus, promoting the transformation of agricultural information into productive forces more effectively. Recently the users' demand for information has displayed new characteristics; consequently, a new aspect of information service has appeared.

1. All-Round Service

Reform of the rural economy system in China is proceeding toward a higher level. Production is changing from scattered plantations to specialized ones and management is transforming from a closed form to an open one. Information demand and utilization have started to permeate throughout the whole process of agricultural production. Farmers have an urgent need for an all-around information service supplying such information as market circulation, new technique applications, guarantees of production conditions, pre-harvest, mid-harvest, and post-harvest data. For example, because of the farmers' demand for diversification, the Dahe township information station of Huailu county, Hebei province, made every effort to collect technical information on planting melons and vegetables. Using information on "the technique of cucumber cultivation in a sunlight greenhouse" they helped one demonstration household to grow 80 square meters of cucumbers in sunlight greenhouses, by which the farmer made a profit of 363 yuan in one season. This technique was swiftly extended to 6.7 hectares in the whole township. Farmers' income was increased and the vegetable supply in the city was enriched. They introduced fine varieties and imparted advanced cultivation techniques to the farmers. They purchase plastic-film, greenhouse materials, fertilizer, pesticides, etc., and sell them to farmers at a favorable price. They sent full-time information personnel to Beijing, Tianjin, etc., to investigate and transmit the market situation there and helped farmers sell more than 10 million kg of watermelons, which is about 40% of the total output, increasing income by 2.5 million yuan. Through all-round information service, they have successfully transmitted research achievements to farmers, accelerating the transformation of information and technology into productive forces.

2. Integration

In the course of specializing their production, farmers have united voluntarily to form more flexible and more vigorous economic cooperative organizations, such as the various farmers' societies or rural associations. They form liaisons with colleges and universities, research institutions, supply and marketing departments, and establish contacts with individual farm households, forming a main bridge to provide scientific information and advanced techniques to the countryside. Up to now, more than 90,000 such associations have been formed throughout the country, spreading over more than 140 professions such as field crops, poultry breeding, animal husbandry, aquatic farming, processing, special products, etc. Lu Guoxin, a farmer in Hejian county of Hebei province, together with twelve other cotton-growing households, set up the Guoxin Cotton Research Society. The society constitution, which promotes self-service, mutual benefits, and bearing risks together, was formulated and they established close information and technological ties with Beijing Agricultural University, the Hebei Academy of Agricultural Sciences, and the Institute of Cotton, CAAS, etc. The society provides its members with the latest information, new technology, fine varieties, necessary materials, and service, and guarantees a member's production and a market for his products. This has brought about encouraging economic results for members. Because society members adopted suitable varieties of high quality and high yield, cotton yield per hectare was 30% higher than that of nonmembers, and the price per kilogram of ginned cotton is 0.4 yuan higher than that of nonmembers. The seed was sold as fine

varieties at a price of 1.6-2.0 yuan/kg. Net income per hectare is 8,916 yuan, which is 100% higher than nonmember's. Integrated services have exerted a strong attraction to the farmers, and now the members of the society have increased to 1,300. They take information as a guide, science and technology as the backing, and supply and market demand as the support, having opened a new way to integrate production, supply and market demand for the development of commodity production.

3. Specialization

Farmers yearn for a specialization of agricultural service. They hope materials and their products can be supplied and sold promptly just by a telephone call. According to statistics, there have already been 1,765 various agricultural technical contracting groups in Hebei province. They have contracted 2,577,000 hectares of wheat, corn, rice, cotton, melons and vegetables, fruit trees, etc., and have achieved significant economic benefits. A standardized wheat cultivation group of Cixian county contracted 80,000 householders' 17,000 hectares of wheat in 1987. Consequently, yield per hectare reached 4,590 kg, 22.4% higher than that of the previous 3-year average. Specialized services have laid a solid foundation for the socialization of production.

II. Establish a New System of Information, Technology, Production, and Marketing

The household production contracting system in rural areas of China is an organizational structure based on the individual farm household. Rural information and technical services for thousands of individual farm households, transmitting information, promoting technical progress, and forging communication links, have formed a new system of information, technology, production, and market, which can be adapted for the rural development of our country.

1. Network structure and its supporting system in the new system.

The new integrated system of information and technological service below the county level has the county service center as its core, the township service station as its backbone, the village service group as its basis, forming a 3-level network of information service. Information contacting households and technical demonstration households are used as examples to form the supporting system. The responsibility of the county service center is to collect various pieces of information, to distribute it to appropriate towns, to introduce adaptable techniques, to train information personnel for town or village and to purchase the necessary means of production. Township service stations take the information issued by county service centers, and hand it out to farm households directly, and train and guide the contacting and demonstration households, providing the households with the contract-stipulated means of production. Village service groups carry out low-charge specialized service, such as distributing fine varieties, tractor-plowing, fertilizer preparation, chemical weed control, disease and pest control, irrigation, harvesting and threshing, etc.

The two kinds of households (information contacting households and technical demonstration households) play a leading role in the development of rural commodity

production, and are an important crux of the network. They first adopt the new information and new techniques. Experimental projects of research institutes are undertaken by the two households first. Only after that are they popularized and extended among all farmers. Dahe town of Huailu county, which includes 16 natural villages, has set up 35 township contacting households, 175 village contacting households, and 220 technical demonstration households, having formed a well-informed, criss-cross network of information and demonstrations. In 1988, just by transmitting useful information, they brought about economic benefits totalling as much as 2.98 million yuan.

2. The characteristics of the new system

The new system is an inevitable outcome of the deep development of the households production contracting system. From its very beginning, the new system has been interrelated with rural economic development, and has been closely linked with farmers' demand. So it has a solid foundation and great vitality. In practice, it is continually being replenished, perfected and strengthened.

(A). The source of information varies. County service centers have a wide range of information sources. They can select adaptive information accordingly in the light of the characteristics of local resources. The Huailu county service center obtained ecological information of the Zhang Jiakou Pastoral area from related departments. They transmitted information on developing livestock farming to related towns and villages, considering the preponderance of hilly area and the abundant forage grass in the county. They helped farmers acquire credit funds, purchase 22,500 feeder cattle from Zhangbei county, and fatten them in this county. As a result, large numbers of cattle-raising households emerged in the poor hilly area, thus opening up a new way for farmers to make money.

(B). Know the technology. Transforming information into productivity is bound to be involved in the process of changing technique into materials. County and township service centers or stations concentrate information and technology into a single body to conduct technical consultation, guidance, training and operations at any time. They are versed in both theory and practice, and well-received by the masses. Having grasped the information of plastic film mulching cultivation for corn, the Fengning county service center has continuously run a technical training class 515 times, showed videotape of the technique 49 times, printed and distributed 12,000 copies of the technical data, trained township and village technicians totaling about 77,400, and held a number of on-the-spot meetings to demonstrate the technique personally. Consequently, the technique was extended to 163.3 hectares that year, the yield amounted to 10.8 t/ha, which is 40% higher than that of conventional methods. Thus, a new yield-increasing method had been discovered for corn production in cool highland regions.

(C). Emphasize practical results. Agricultural production has a close relationship with the performance of county and township service centers or stations, which has become an important criterion in measuring their working achievements. Therefore, they share a common aspiration and goal with the farmers and take high quality service as their

objective, and provide farmers with a convenient, satisfactory and beneficial service, rather than making a profit from them. In order to assure the steady increase in use of plastic film mulching in corn planting, the Fengning county service center had made 195,000 kg of fine varieties, and purchased 153 t chemical fertilizer, 1.9 t pesticides, 32.6 t plastic film, and 111 pieces of farming implements to sell to farmers at a favorable price, making the farmers feel that not only is the information available, but also the means of production and appropriate techniques are guaranteed.

3. The new system has showed great vitality in practice.

The agricultural information and technical service system and network below the county level are emerging, and will be developed and improved continually in the course of production. At present, 92% of the towns in Hebei province have established all-round service organizations, in which 50% of them have attained the standards of the "Four Necessities" (i.e., organization, personnel, information, business). More than half of the villages have set up service groups, and most of them have reached the standards of the first "Three Necessities" (i.e., organization, personnel, information). In the whole province, 110 counties have established information contacting points, contacting households, and demonstration households, accounting for 73% of the total number of counties and cities in the province. The number of rural information contacting points has increased to 11,250, and the number of information contacting households 100,000. There are 72,800 people engaged in agricultural information service at grass-root units below county level, of which 3,732 are well-educated (possessing a college or polytechnical school diploma). Through various means, more than 20,000 agricultural information personnel have been trained. Their professional ability has constantly improved. Thus, an important force for promoting agricultural technological development has been formed.

The agricultural information and technical service center of Wuqiang county, Hebei province, learned that Tianjin trading port would export large quantities of chili. So they signed a contract with the Tianjin foreign trade department to export 55,000 kg of chili, thus opening up a profitable endeavor for farmers of the county. By means of broadcasting, holding rallies, putting up blackboard newspapers, printing information, etc., they propagandized information on enriching the chili crop, the world market for chili, quality and standards required, cultivation techniques, harvesting and processing technique, etc. In addition, they established a chili grower's dossier, to provide appropriate pre-harvest, mid-harvest, and post-harvest service. The total output of chili amounted to 125,000 kg, and the total income 300,000 yuan RMB. The economic benefit amounted to 200,000 yuan RMB. The service center received 3,000 yuan RMB as a service charge, for the purpose of expanding its own service forces. For another example, Li Pingfen, an agricultural information specialist at Chang Zhuang village of Anguo county, set up an information service station for medicinal herbs. She published fifty issues of *Information from the Medicinal Capital of China*, including information on making profits, the market situation, trend forecasting, cultivation techniques, etc. Readers can basically grasp current information on production, supply and marketing, cultivation and processing of medicinal herbs. Huang Zhenhe, a farmer at Huangjia village in Buoxing county of Shandong province, learned from the 40th issue of

Information from the Medicinal Capital of China that *Typha angustifolia* L. was in short supply. So, using local resources he collected and processed 4,000 kg of *T. angustifolia*. With the help of the information station in selling, he made a net profit of 27,000 yuan RMB. This information station employs a total of about 340 information personnel. Making full use of their information resources, they helped farmers sell 1,200 million kg of vegetables, 50 million kg of watermelons, 0.5 million kg of strawberries, and 200 million potato seedlings in one year. The economic benefit is 100 million yuan RMB. However, they only received 30,000 yuan as a service charge. What is taken from the people is used in the interests of the people.

In Hebei province, this new emerging trend has been fervently supported and properly guided. In the whole province, 10 prefectures and cities, and 23 counties have been equipped with microcomputers, which have laid a solid foundation for the modernization of grass-root agricultural information services. Some counties have also established guidelines such as: "rules of agricultural information service," "rewarding rules of agricultural information service," "assessing methods of agricultural information service." Therefore, the development and improvement of the new system and network are ensured. In the rural area of Hebei province, transforming agricultural information into productivity is being accomplished before our eyes in an entirely new way.

References

1. Liu Zhihui: On the Characteristics and Development Strategy of China's Scientific and Technical Information Work in Current Stage. *Journal of Information Science*, 8(1) 1989: 45-50
2. Xu Kedong: Main Battlefield and Service Mode of County-Based Science and Technology. *Scientific and Technical Information Work*, (3) 1988: 2-3
3. Li Bingqian: On Stretching Service Scope of Local Information Organizations. *Enterprise Information and Practice*, (1) 1988: 9-11
4. Yuan Yiaojun: A Study on Trend of World Science and Technology Information and Reform of China Science and Technology Information Work. *Information Science and Technology*, (1) 19