

# MODERN AGRICULTURAL DIGITAL MANAGEMENT NETWORK INFORMATION SYSTEM OF HEILONGJIANG RECLAMATION AREA FARM

Xi Wang<sup>1</sup>, Chun Wang<sup>\*</sup>, Wei Dong Zhuang<sup>1</sup>, Hui Yang<sup>1</sup>

<sup>1</sup> *Engineering Collage, Heilongjiang August the First Reclamation Land University, Daqing, Heilongjiang Province, P. R. China 163319*

<sup>\*</sup> *Corresponding author, Address: Engineering Collage, Heilongjiang August the First Reclamation Land University, Daqing, Heilongjiang Province, P. R. China 163319  
Tel: +86-459-6819224, Fax: +86-459-6819224, Email: wangchun1963@126.com*

**Abstract:** To meet the need of agriculture management modernization of Heilongjiang reclamation area, further boost large-scale integration level of modern agriculture production and boost management level of agriculture production. On Red Farm, we have established the digital management network information system with the remote sensor technology, GIS technology, GPS technology, database technology, network technology, agriculture intelligent technology, multimedia technology, information auto acquired technology and control technology applied in the system. Modern agriculture digital information system of Red Star farm is composed of base construction of agricultural digital information, digital management system construction of agricultural production, digital technological equipment of agriculture etc. The digital and network management of agriculture can offer all management department the best convenient to master management information in time and boost the technological level of agricultural production, form the digital technological system of farmland, explore new way of agricultural production in information age and seek new production way of high efficiency, high production, high quality, low consumption.

**Keywords:** agricultural production, agricultural information, network system, geography information

## **1. PREFACE**

At present, Heilongjiang reclamation area has already established the largest scale national farmland group with the highest degree of mechanization. Heilongjiang reclamation area takes modern agricultural equipment as guidance and development modern agriculture firmly. According to the need of agricultural modernization of Heilongjiang reclamation area, to further boost large-scale integration level of modern agriculture production, boost management level of agriculture production, establish the digital management network information system. The digital and network management of agriculture can offer all management department the best convenient to master management information in time and boost the technological level of agricultural production.

## **2. FARMLAND INFORMATION SYSTEM OF AGRICULTURAL PRODUCTION MANAGEMENT**

Farmland information system of agricultural production management is composed of management schedule center of agricultural production, remote sensor material of farmland, GIS, crop farming digital information system, digital management information of agricultural machine, irrigation digital information system of farmland, forestry digital information system of farmland, stock raising digital information system of farmland, weather information system etc([Zhuang Weidong et al., 2005](#)).

### **2.1 Management and schedule center of agricultural production**

The management and schedule center is cored by management information system of agricultural production, 3S (GPS, GIS, RS) technology and network technology. The management information of agricultural production and video monitor information is displayed on the 126 inches plasma board. The screen constitutes 3\*3 42 inches plasma screen and the size of the screen is 2880 \* 1670 \*176 mm. The screen is equipped with a RGB matrix, a video and audio matrix, plasma screen control computer and operation display computer of agricultural production management schedule.

## **2.2 Remote sensing information system of farm blocks**

Purchase the satellite remote sensing images covered the whole farmland with 2.5meter resolution ratio and measure at the certain point on the ground. After geometry adjustment, the ground position space information of farmland including farm blocks, road, irrigation, forestry, reservoir, residence area is gained to transfer the remote sensing material to system server. Through GeoBeans network Web GIS software, by using network browser, the operation including zoom in, zoom out, move, distance measurement, land block area measurement can be practiced to facilitate the overall planning and production management of farm.

## **2.3 Geography Information system of farmland**

Establish the farmland time and space database through deciphering the remote sensing images, adjusting the demonstration area space data, and acquiring the crop planting production information in relation with space data. Introduce GeoBeans Web GIS software developed by Remote Sensing Institute of Chinese Academic of Science and the function including zoom in, zoom out, move, farm block inquiring, the longitude and latitude of current position, distance measurement, land blocks area measurement can be practice. The agricultural information management and space information visualization can be realized. Input the farmland blocks map and previous land number to computer, and base condition and geography position of certain number block can be inquired on the computer.

## **2.4 Network information system of agricultural machine management**

Network information system of agricultural machine management is composed of agricultural machine management database, GPS dynamic tracing and scheduling system, remote network video monitoring system, working machines wireless remote video monitoring system, GSM short message group sending system, working progress statistic system, single working machine assignment statistic system, agriculture machines pervious statistic data and agriculture machine usage experience exchange system(Li Qiang et al., 2007).

## **2.5 Crop farming digital management information system**

The system includes geography information system of farmland,

geography information system of soil nutrient (N, P, K, PH value, organic matter), soil nutrient database and land blocks file database information. The computer management and network support of agriculture data information and data resource sharing provide reliable information and data support for decision analysis of agriculture production management. Design crop farming digital management web pages for Red Star which include brief introduction of crop farming, policy and law for agriculture production management, agriculture resource photos, agriculture production management photos, agriculture production propaganda photos, announcement and news distribution, contact ways and responsibilities of agriculture production management department.

## **2.6 Digital management information system for organic agriculture production**

The system includes inquiry of organic production executive standard information, inquiry of organic crop production operation regulation, inquiry of organic crop disease prevention and cure, traceable system of organic production etc.

## **2.7 Digital management information system for farmland irrigation**

On the base of investigation and research to production management and water resources on Red Star farm, we established specialized database and resource database and form the digital management information system of farmland irrigation for Red Star farmland. The system includes farm irrigation geography information system and natural irrigation resource information database. Establish relative database information management system through accumulation of scheme and technology step by step. The computer management and network support of irrigation data information and data resource sharing provide reliable information and data support for irrigation management decision analysis.

## **2.8 Digital management information system for forestry**

Digital management information system for forestry is cored by “3S” technology which is data sharing information system supported by network technology and database technology. The system includes forestry GIS, information database of forestry resource information, forestry ecological management and protection, forestry production management, forestry fire prevention, afforestation and policy and law information. Establish relative

database information management system through accumulation of scheme and technology step by step to achieve the computer management and network support and data resource sharing. The system can provide reliable information and data support for forestry management decision analysis through inquiry of forestry network database.

## **2.9 Digital management information system for stock raising**

Stock raising information industry is the development direction of modern stock raising and it is the only way of sustainable development. Establish stock raising information which can drive the modernization of stock raising. The system includes stock raising information system, stock disease assistant diagnose system, milk cattle management and standard specification and laws which are significant for agriculture and country economic development.

## **2.10 Weather information system**

There is a close relationship between weather and agriculture and the master degree of weather information can affect the agriculture production efficiency directly. The weather information system can help farmers and manager to master the local weather information and make scientific production decision. The system includes weather forecast, agriculture weather, artificial weather information and weather magazine.

# **3. USAGE EFFECTS OF THE SYSTEM**

Modern agriculture development center of Red Star farm in Heilongjiang reclamation area takes “stand on digital agriculture and develop modern agriculture” as construction logos. Save resources and gain profit to the largest extent through GPS technology, GIS technology, RS technology and high technology investment and management. Agriculture production schedule and command and calculation by use of network information system transform agriculture management from original distributive and extensive management to present integrative and network management. The system provides a convenient way for producers and management staffs to learn working situation and income and expenses and daily dynamic information of agriculture production about the whole farm on the web.

#### **4. CONCLUSION**

Red Star farm in Heilongjiang reclamation area can take advantage of large scale farmland modern agriculture production and boost agriculture production management level and bring the farm agriculture production to network, digital and information age through the modern agriculture digital management information system. The system can make agriculture production more scientific, standard, quantitative and more efficient and force the optimization of agriculture economic structure and transformation of agriculture growth. The system opened the first modern agriculture production management mode for Heilongjiang reclamation area under new system and new situation.

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