

# Application of remote sensing technology in agriculture



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Application of Remote Sensing Technology in Agriculture CONSIST & mote Sensing Monitoring Operation System for Agriculture Shoo YANG Remote Sensing Application Center Ministry of Agriculture of China Beijing, China 100026 E- nail: [email protected] Gob. CNN Abstract: The research and application of remote ; ensign technology in agriculture started in late sass in China.

Over past 30 years of government and on the basis of technical introduction, R&D, the remote sensing : genealogy in the Chinese Ministry of Agriculture has become one of elementary nears in monitoring growth of main crops, production prediction and soil moisture : intent etc. The general objectives of remote sensing monitoring system in the Violinist of Agriculture are to establish a dynamic monitoring system covering the Manhole country, with complete system, combination of remote sensing with ground and stable operation.

The focus is on constructions of systems of conducting main : rope remote sensing monitoring, agricultural resource monitoring, and commiseration of digital and fine agriculture in terms of monitoring. This paper is to ' resent existing status of remote sensing monitoring operation system of Remote Sensing Application Center of the Ministry of Agriculture, including major contents of emote sensing monitoring, adoption of key technology and framework of operation ; yester and outlook for further development. . Major Contents of Remote Sensing Flooring 1. 1 Remote Sensing Monitoring for Main Crops Since 1999, Remote Sensing Application Center of the Ministry of Agriculture worked on continuously -emote sensing monitoring on the main crops in the whole country for 8 years, the monitoring targets including 5

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main crops, namely, rice, wheat, corn, soybean and : ton and monitoring content covering planting area, growth, disaster and ' reduction etc. Mongo which, monitoring on sown area completed one month before arrives; monitoring on soil moisture content and growth conducted once every two weeks; monitoring on production once every month in late stage of growth; and anemic monitoring and assessment done on major agricultural natural disasters of frost and flooding etc. Based on the occurrence of disaster. 1. 1. 1 Planting Area Monitoring. The area monitoring mainly adopted the commercial satellite data of Landsat, TM, SPOT, CABERS, IRS and PA etc. With monitoring scale of covering main ' reduction zones. 1. 1. 1. 1 Payday Rice Monitoring. The monitoring on rice planting area in the whole country includes early-mature, one-crop and late-mature rice. The monitoring zones for early-mature rice are located in 6 main production provinces, i.e. Henan, Anhui, Jiangsu, Gubei, Henan, Anhui and Hubei. The locations of remote sensing monitoring zones show below: Optional Distribution of Early Payday Rice Monitored by Remote Sensing The monitoring zones of one-crop and late-mature are in 14 provinces and cities, i.e. Henan, Hubei, Anhui, Jiangsu, Shandong, Henan, Jiangxi, Gubei, Anhui, Fujian, Sichuan, Guangdong, Hainan, Yunnan Ana Along. Monitoring zones show below: I need locations AT remote sensing National Distribution of One-crop and Late Payday Rice Monitored by Remote Sensing I . 1. 1. 2 Winter-wheat Monitoring. The monitoring zones of winter wheat mainly are in major winter wheat production areas of Yellow River, Haihe River and Haihe River -basins, including provinces of Henan, Hebei, Shandong, Shanxi, Shanxi, Anhui and others, etc..

The locations of remote sensing monitoring zones show below: Optional Distribution of Winter Wheat Monitored by Remote Sensing 1. 1. 1. 3 Corn Flooring. The monitoring zones of corn are in main corn production zones of Overheats and Yellow River, Hawaii River and Hawaii River regions, I. E. Hooliganism, Olin, Loaning, Huber, Henna, Sandhog, Shania, Shania and Annum provinces, etc. The actions of remote sensing monitoring zone show below: National Distribution of Corn Monitored by Remote Sensing I . . 1. 4 Soybean Monitoring. The monitoring zones on soybean mainly are in North-B±sat production areas of Hooliganism, Jill, Loaning, Eastern part of Inner Mongolia, Overthrow Hawaii River region of Annum province as concentrated production zones of fellow River, Hawaii River and Hawaii River regions. The locations of remote sensing monitoring zones show below. Optional Distribution of Main Soybean Production Areas Monitored by Remote Sensing 1. 1. 1. 5 Cotton Monitoring.

The monitoring zones on cotton are mainly are in : here key production zones of North-west, Yellow River, Hawaii River and Hawaii River -sessions and mid- and low-reaches of Yanking River, I. E. Gaining, Huber, Henna, Sandhog, Jungian, Annum, Axing and Huber provinces and autonomous regions. The action of remote sensing monitoring zones show below: National Distribution of Cotton Monitored by Remote Sensing 1. 1. 2 Crop Growth Flooring. The monitoring of crop growth adopted climatic satellite data of MOOD'S, WA and FYI etc. , in combination with ground survey.

The monitoring and assessment on crop growth show below in comparison with results for two years. Optional Image of Winter-wheat Growth Conditions Monitored by Remote Sensing I . 1. 3 Monitoring and Assessment of Natural <https://assignbuster.com/application-of-remote-sensing-technology-in-agriculture/>

Disasters in Agriculture. The monitoring MD assessment on soil moisture content and dry disaster are conducted on the 'ass's of remote sensing model of index of vegetation water supply, soil thermo inertia quantity, anomaly vegetation, etc, combined with climatic observation data of aroma precipitation and ground survey and proofing.

Optional Soil Moisture Situation Mid Feb.. 2006 4 crop Production Molting. I nee monitoring on mall crop production adopts integrative estimation of production by model of agricultural climate, remote sensing and growth and combines monitoring results of crop growth and information of around survey. 1. 2 Remote Sensing Monitoring on Agricultural Resource. 1. 2. 1 Flooring of Changes of Regional Agricultural Land by Remote Sensing.

The : imprison monitoring method of two time remote sensing images coverage is applied to carry out remote sensing monitoring of agricultural used land change ±early and later in the regions of Northeast, Beijing, Tannin, Huber reaches of Yellow : ever, Hawaii River and Hawaii River and to obtain data on decade changes of : ultimate land, grassland, garden, water area and unused land for providing Monumental information for agricultural planning, structure adjustment and -congenial overall arrangement. 1. 2. 2 Grassland Resource Monitoring by Remote Sensing.

The method combining the remote sensing with ground monitoring is used ???? implement the remote sensing monitoring on grass growth, production on }Roseland and grass-animal balance in grazing and semi-grazing lands. Striation of Grass Yielding in 2006 1. 3 Ground Monitoring Network Year 2005 saw 100 national ground monitoring network counties in

main farming regions of the : entry in order to further update accuracy and reliability of remote sensing monitoring system, executing ground monitoring on soil moisture, crop growth and ' reduction to support and confirm the remote sensing monitoring by ground data. . Recherché Methodology The Agricultural Remote Sensing Operation System adopts : he following key technologies, based on information technology of remote sensing, ASS, GAPS and Internet etc. ND taken remote sensing technology combined with ground survey as basic monitoring meaner: 2. 1 Cropping Area Monitoring. The technology of remote ; ensign statistics is applied to monitor annual changes of crop planting acreages.

Skirts, sampling frame is designed by stratified sampling methodology according to saturation of cropping zones; second, drawing samples of annual changes of : roping areas units by remote sensing images; and finally, the national annual : hang is calculated by Richardson model. Ground sample square should be laid to ; plummet and support the remote sensing monitoring at the same time of remote ensign monitoring. 2. 2 Crop Growth Monitoring. The relative sound correlation of VIVID, leave area index, biomass and content of chlorophyll is elementary indication : actor for crop growth.

The monitoring on crop growth adopted MIND as parameter is Used to calculate MIND value of crops for two years in the neighboring area to the ; name monitored zone, and error value that is divided into grades, this monitoring the ; mound or worse growth of crops in different year in the same region. The comparison current MIND with past years MIND in the same period is utilized for preparation of ; tankards of grading. 2. Monitoring <https://assignbuster.com/application-of-remote-sensing-technology-in-agriculture/>

and Assessment of Natural Disasters in Weissmuller. The Monitoring and assessment on natural disaster in agriculture : notations monitoring on soil moisture content and dry and flooding disasters.

The monitoring on soil moisture content and dry disaster is used with thermal inertia and allegation water supply, combined with date of ground actual survey of soil moisture, o sees Dish molting model AT solo moisture Ana assess array solution on ten Dad's type of crops and periods of growing and development. The monitoring on flooding assister is applied with climatic satellite image to obtain information on scale of flood ND logging and time etc, and disaster statistics and loss assessment are conducted ' y integration with GAPS and monitoring on crop growth. 2. Crop Production Flooring. Due to complex of production monitoring, the remote sensing operation ; yester adopts integrative monitoring on production. The integrative analysis of ' reduction is worked out by production monitoring model, crop growth, results of assister monitoring and information on ground survey, among which, the crop Roth model including agricultural climatic model, remote sensing model and crop Roth model etc. 3. Operation System The remote sensing monitoring system of the Violinist of Agriculture is composted of two parts, I. E. Remote sensing and ground network.

The organization system of unified leadership, work division and : ordination is shaped up on the basis of 7 regional sub-centers in the area of -emote sensing monitoring. At present, there is a specialized technical group : imposed of over 200 persons, equipped with appropriate equipment and capacity of working on remote sensing monitoring on crops, agricultural - source, natural disaster and service. In terms of ground network, the <https://assignbuster.com/application-of-remote-sensing-technology-in-agriculture/>

arrangement 100 national monitoring network counties launched in 2005 in China, all network Joint equipped with computer, ground survey equipment and database software B±etc. Regular train conducted on monitoring technology to primarily form a team of around monitoring. The Remote Sensing Operation Center of the Ministry of Weismuller has set up a relative efficient operation mechanism, through combination remote sensing monitoring with ground network, to realize the automatic integration of work at central and local levels and to provide improve of agricultural -emote sensing application with high efficient organization guarantee. Regional Distribution of National Center and Sub-centers of Remote Sensing Optional Distribution of Counties with Sample Fields 4.

Development and Outlook 4. 1 Technical Progress. The remote sensing technology now shows trend of fast development, representing more and more commercial ; titillates and further improvement of pixels of space, spectrum and time of satellite mage. Application of new technology further upgrades accuracy and reliability of agricultural remote sensing operation system while the standard of professional )operation is also updated gradually. The remote sensing will be the important meaner gaining information and become the information collection, treatment and analysis yester integrated with conventional statistic survey. . 2 Expansion of Operations. Ninth gradual growth of operations of agriculture remote sensing, its business will be ? Expanded in following two aspects: 1 . Expansion of monitoring content, that is, Rather expanding to monitoring on major crops of oil and sugar crops etc. On the ' ass's of the present 5 crops; and 2. Expansion of survey on crop planting area Carjacking Trot current



monitoring on annual change AT cropping area. 4. 3 system : implosion. The agricultural remote sensing monitoring system is composed of national center, regional sub-center and ground monitoring network counties.