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中国农业信息化技术发展现状及存在的问题

Current situation and existing problems of agricultural informatization in China

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中文摘要:

围绕农业传感器技术、精细农作技术、农业机器人技术、农业物联网技术和农业信息服务技术五大方面，对农业信息化前沿技术的发展态势进行了分析，同时探讨了中国农业信息化前沿技术发展存在的问题并提出了相应的建议。研究表明，农业传感器技术是农业信息获取与信息化的基础，精细农作技术代表了当今农业装备的先进水平，农业机器人技术是未来农业智能装备的重要方向，农业物联网技术是农业监管与质量监控的有效手段，农业信息服务技术则愈来愈聚焦农业信息服务中的云存储、云计算、云服务和移动互联的关键技术问题。

英文摘要:

Abstract: This paper analyzes the development trends of frontier technology for agricultural informatization including five aspects of agricultural sensor technology, precision farming technology, agricultural robot technology, agricultural internet of things technology, and agricultural information service technology. It also discusses the existing problems in the development of frontier technology for agricultural informatization in China and proposes corresponding countermeasures.Firstly, the paper introduces the frontier techniques for agricultural informatization. For advanced agricultural sensor technology, three types of techniques are described, namely life information sensing technique, environmental information sensing technique, and comprehensive information collecting technique. For precision farming technology and intelligent equipment, onboard farmland information collection technique, precision farming positioning and controlling technique, decision model and prescription generating technique, and precise implementation technique are described. For agricultural intelligent robot technology, terrestrial mobile platform navigation and control technique and action planning technique are introduced. For agricultural internet of things technology and equipment, several issues are discussed including the sophisticated monitoring and scheduling of resources, ecological environment monitoring and management, agricultural product quality safety traceability, etc. For agricultural information service technology, frontier techniques and applications for agricultural remote sensing and agricultural information resource value-added services are evaluated.Major problems existed in the development of agricultural informatization technology in China are also discussed. For agricultural sensor technology, the existing problems include that the agricultural information dynamic sensing technique needs to be improved, advanced agricultural sensor technique and industry development are not perfect, and agricultural sensor after-sales supports arenot sufficient. For precision farming technology and intelligent equipment, China has not had its 3S technical support system that is suitable for agricultural applications and its intelligent equipment research and development is not sufficient. For agricultural robot technology, the research direction selection is very subjective, and the research content mainly focuses on the planting industry. Leading robot research agencies rarely involve the agriculture domain. For the industrialization of agricultural robot, related domestic patents are not sufficient and foreign companies take a large market share. For agricultural internet of things technology and equipment, there are also some problems in the technology standard, security, industrialization, application and promotion. For agricultural information services, agricultural remote sensor practicality needs to be improved, software development capability is not sufficient, and the service targets are not well trained.Finally, suggestions are proposed as countermeasures to the existing problems. Agricultural information technology innovation needs to be accelerated. Major engineering projects need to be established to support the informatization development. Subsidies for agricultural informatization need to be implemented. Agricultural informatization standards and evaluation system need to be improved.Researches show that agricultural sensor technology is the basis of agricultural information acquisition and informatization. Precision farming technology represents today's advanced level of agricultural equipment. Agricultural robot technology is an important research direction for agricultural intelligent equipment in the future. Agricultural internet of things technology is an effective means of agricultural supervision and quality monitoring. Agricultural information service technology is more and more focusing on the key technical problems of cloud storage, cloud computing, cloud service and mobile internet in agricultural information services.

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