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Discussion on Equipment Maintenance Technology in Agricultural Mechanization and its Automation Application

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Abstract: With the continuous development of modern agriculture, agricultural mechanization and its application of automation have increasingly become the general trend. However, the normal operation and service life span of agricultural equipment directly affect the efficiency and cost of agricultural production. Therefore, it is necessary to explore the important role of equipment maintenance technology in agricultural mechanization and its automation application, and put forward targeted technical optimization measures, in order to make a contribution to the healthy development of related fields.

Keywords: Agricultural mechanization; Automation application; Equipment maintenance; Technology optimization

Introduction

With the rapid development of science and technology, the agricultural production mode is undergoing a great change from traditional farming to modern agriculture. As an important part of modern agricultural development, the application of agricultural mechanization and automation has injected new impetus into the realization of accurate and efficient agricultural production. However, good operation of agricultural machinery equipment cannot be separated from perfect maintenance technical support. Only by strengthening the technical level of equipment maintenance, can we escort the modern agricultural production.

1. The important role of equipment maintenance technology in agricultural mechanization and its automation

1.1 Improve the mechanical operation efficiency

The level of agricultural machinery equipment maintenance technology directly determines the operation state and use efficiency of machinery. Good maintenance helps the mechanical equipment to maintain the optimal working condition and ensure the continuity and efficiency of agricultural production operations. Regular maintenance of the machinery, can timely detect and eliminate all kinds of hidden dangers, to avoid the occurrence of faults. And timely repair of faults can also make the machinery as soon as possible to resume normal operation, shorten the downtime, improve the operation efficiency. With the continuous improvement of the level of agricultural mechanization, the operation capacity of a single equipment is more and more strong, so it is particularly important to maintain the efficient operation of machinery, otherwise it will cause operation delay, affect the agricultural time, and then affect the yield and crop quality.

1.2 To prolong the service life of the machinery

Proper maintenance can effectively extend the service life of agricultural machinery and equipment. Agricultural machinery often suffers from a variety of harsh environment invasion, such as the hot sun exposure, dust erosion, which will accelerate the wear of the parts. If not timely maintenance, it will lead to the rapid aging and failure of the parts, and shorten the service life of the whole machine. By timely troubleshooting and solving potential faults, to avoid the accumulation of small problems, it can effectively delay the aging process of the equipment, and maximize the use value of the equipment. In addition, regular preventive replacement of parts is also an important part of maintenance, which can prevent in the bud, ensure the overall condition of the equipment is good, and extend the service life. With the continuous improvement of the maintenance technology level, the service life of agricultural machinery and equipment will be greatly extended, which can effectively reduce the investment of fixed assets.

1.3 Reducing agricultural production costs

The improvement of the maintenance technology level can reduce the equipment failure rate, reduce the maintenance frequency and maintenance cost expenditure. The maintenance costs of agricultural machinery and equipment generally include labor, spare parts, energy and other expenses. If the maintenance technology is backward, resulting in frequent maintenance, these costs will increase substantially. In

addition, frequent equipment failures will also delay the farming time, indirectly increase the human and material costs. In contrast, good maintenance technology can greatly reduce the chance of equipment failure, reduce the number of maintenance, thus saving maintenance costs. At the same time, the extension of the service life of mechanical equipment also greatly reduces the investment of fixed assets in agricultural production, without the need to frequently update the equipment, thus reducing the overall production cost.

2. Technical optimization of equipment maintenance technology in agricultural mechanization and its automation

2.1 Establish fine maintenance management

The farm shall establish a complete equipment operation record system to record the equipment use and maintenance in detail. Can use modern information means, such as using the handheld terminal APP or online system to record equipment data, to achieve the efficient transmission and sharing of information[1]. Operation data, including equipment model, use time, working environment, maintenance records, etc., are an important basis for making maintenance plan. Accurate data helps to analyze the cause of equipment failure and predict the maintenance needs, so as to develop more targeted maintenance strategies. It is also essential to develop a feasible equipment maintenance plan. Attention should be paid to distinguish between the maintenance cycle requirements of different equipment, because the aging degree of equipment varies among different types and operation intensities. Large equipment such as heavy tractors and combine harvesters require more frequent routine maintenance. At the same time, preventive maintenance should be combined with fault diagnosis and maintenance to prepare for a rainy day. The specific contents of maintenance include cleaning, inspection, adjustment, lubrication and parts replacement, etc. Regular and comprehensive inspection can find hidden dangers, and the replacement of preventive parts can also avoid sudden failure. In addition, timely tracking the changes of the equipment condition, dynamically adjusting the maintenance plan according to the actual use situation, can extend the service life of the equipment to the greatest extent, and improve the production efficiency. The person in charge of the farm should pay attention to equipment maintenance, provide necessary training for equipment management personnel, and ensure the mastery of advanced maintenance technology, so as to improve the quality of equipment maintenance.

2.2 Improve the skills of maintenance personnel

It is very important to increase the professional training of agricultural machinery maintenance personnel and improve their theoretical knowledge and practical operation skills. In terms of theory, the training should cover the principle of mechanical structure, electronic circuit and fault diagnosis and analysis, and lay a solid professional foundation[2]. In terms of practical operation, a lot of practice time should be arranged to cultivate students' ability to assemble and assemble equipment. Experience teacher on-site guidance is also an essential training link. In addition to initial training, continuous education training should be conducted regularly. With the emergence of new technologies, maintenance personnel will be eliminated by The Times. Therefore, technical personnel are encouraged to track and learn new technologies, new processes, and update the concept and way of maintenance with The Times. It can be achieved by attending forums, seminars and advanced courses. The innovation of maintenance technology needs a group of high-quality talents with innovative thinking and practical ability, and the construction of talent team should be the top priority. The training content should not be limited to a single brand or specific models, but should widely cover all kinds of mainstream agricultural machinery products, so that the maintenance personnel have a comprehensive professional accomplishment. At the same time, the training should also permeate the awareness of safety production, and emphasize the personal and equipment safety during maintenance operations. Regular safety knowledge training helps to master the standard operating procedures and prevent and avoid the occurrence of safety accidents. Through systematic and comprehensive training, we can forge a high level of agricultural machinery maintenance talent team, for mechanized agriculture with flying wings.

2.3 Innovate maintenance technology

We should pay attention to the introduction and application of advanced maintenance technology and equipment, which is a shortcut to improve the maintenance level. For example, remote diagnostic maintenance and robot-assisted maintenance technology are both the future development directions[3]. Remote diagnosis technology can monitor the running status of equipment in real time, diagnose faults remotely, and avoid long on-site maintenance time and high travel cost. Robot-assisted maintenance can realize the automatic operation and improve the maintenance quality and efficiency. Although the introduction of advanced technology is the only way, but independent innovation is equally important. China's scientific research institutes and enterprises should deeply cultivate in the field of agricultural machinery maintenance, and continue to develop more efficient, environmentally friendly and intelligent maintenance new technology. For example, using big data analysis to optimize the equipment use strategy, develop refined detection and diagnosis system, develop intelligent operation and maintenance system, etc. The government should give strong support, formulate preferential policies and financial support plans, and inject a steady stream of power into agricultural machinery maintenance innovation. At the same time, machine and tool enterprises should also increase investment

in independent research and development, and strengthen cooperation between university, university and research. Only with the double support of innovative concept and capital, the agricultural machinery maintenance technology can develop sustainably and healthily. In addition, the application of advanced technology needs a complete infrastructure and talent guarantee. Speed up high-speed communication network to lay the foundation for remote diagnosis and maintenance, upgrade maintenance workshop and create conditions for advanced equipment deployment and cultivate compound technical talents to make them qualified for new technology maintenance positions. The government, enterprises, universities and relevant institutions should work together to jointly promote the modernization process of agricultural machinery maintenance. Only all-round, multi-angle promotion, China's agricultural machinery maintenance cause can achieve considerable development in the new era.

3. Tag

In short, equipment maintenance technology plays a very important role in agricultural mechanization and its automation application. Agricultural units and relevant institutions should attach great importance to the development of equipment maintenance technology, adopt the combination of scientific management and technological innovation, comprehensively improve the level of maintenance technology, and inject lasting impetus into the long-term healthy development of modern agriculture.

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