

WAYS TO IMPROVE THE EFFICIENCY OF REPAIRING THE MACHINE AND TRACTOR FLEET TO ENSURE THE FOOD INDEPENDENCE OF THE COUNTRY

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Abstract: The paper considers ways to improve the efficiency of repairing the machine and tractor fleet as an important factor in ensuring the country's food independence. The main attention is paid to technical diagnostics, modernization of repair workshops, restoration of worn parts, timely supply of spare parts, and improvement of repair personnel qualifications. It is emphasized that effective repair and maintenance increase the technical readiness of agricultural machinery, reduce downtime and operating costs, and ensure the timely performance of field operations.

Keywords: machine and tractor fleet, repair efficiency, agricultural machinery, technical diagnostics, maintenance, food independence.

Agricultural production is directly connected with the reliable operation of tractors, combines, transport vehicles and other machines that form the machine and tractor fleet of an enterprise. In crop production, any delay in tillage, sowing, plant protection or harvesting may lead to a decrease in yield quality and quantity. Therefore, the repair and maintenance system should be considered not only as a technical component of farm management, but also as an important condition for the stable production of food resources. In the context of ensuring the country's food independence, the ability of agricultural enterprises to keep their machinery in working condition becomes especially significant [1].

The machine and tractor fleet is used under conditions that accelerate the wear of parts and assemblies. Agricultural machines often operate in dusty, humid and abrasive environments, under variable loads and intensive seasonal use. Engines, transmissions, hydraulic systems, running gears and working bodies are affected by friction, vibration, contamination and overloads. If defects are not detected in time, minor failures may turn into serious damage that requires expensive repair or replacement of units. As a result, enterprises face increased downtime, higher repair costs and the risk of disrupting important technological operations.

One of the most effective ways to improve the repair system is the transition from repair after failure to maintenance based on the actual technical condition of machinery. This approach requires the wider use of technical diagnostics and regular monitoring of the main units and mechanisms [2]. Diagnostic tools make it possible to identify deviations in the operation of engines, transmissions, hydraulic systems and electrical equipment before the machine loses its working capacity. Such information allows specialists to plan repair operations in advance, determine the need for spare parts and reduce unexpected stops during the most intensive periods of field work. The

efficiency of repair work also depends on the level of equipment in repair workshops. A modern workshop should be provided with lifting devices, assembly stands, pullers, measuring instruments, washing equipment, diagnostic tools and devices for safe fixation of units. The use of specialized technological equipment reduces the physical load on workers, improves the accuracy of disassembly and assembly operations, and shortens the total repair time. For agricultural enterprises, universal devices are especially valuable, because they can be adapted to different models of tractors, combines and agricultural machines. A separate reserve for improving the efficiency of repairs is the restoration of worn parts. In many cases, it is economically reasonable not to replace a part with a new one, but to restore its working surfaces and extend its service life. Technologies such as surfacing, spraying, electrospark treatment, application of protective coatings, machining, heat treatment and other strengthening methods can be used for this purpose. The correct selection of the restoration method allows not only to return the part to its required dimensions, but also to increase its resistance to wear under further operating conditions [3]. This is especially important for parts that work in contact with soil, plant residues and abrasive materials. The organization of spare parts supply has a significant influence on the duration and quality of repair operations. Even a well-equipped workshop cannot work effectively if the necessary components, materials or tools are not available at the right time. For this reason, agricultural enterprises should analyze the most common failures of their machinery and create a reasonable stock of frequently used spare parts [4]. Such planning is particularly important before sowing and harvesting campaigns, when machinery downtime leads to the greatest economic losses. A properly organized warehouse system helps reduce waiting time and improves the readiness of the machine and tractor fleet.

The human factor is no less important in repair production. Modern agricultural machinery contains hydraulic, electronic, fuel injection and automated control systems, which require a higher level of professional training. Repair workers must be able to read technical documentation, use diagnostic equipment, determine the causes of failures and choose appropriate repair methods. Regular training of personnel, cooperation with machinery manufacturers and the use of modern service information increase the quality of repair and reduce the probability of repeated failures after maintenance [5].

The planning of repair and maintenance operations should take into account the seasonal nature of agricultural production. The greatest load on machinery occurs during sowing, crop care and harvesting. Therefore, the main volume of repair work should be carried out in the off-season, when machines are not involved in field operations. Such an approach makes it possible to prepare the equipment in advance, distribute the workload of repair personnel more evenly and avoid urgent repairs during critical agrotechnical periods.

Thus, the improvement of the repair system of the machine and tractor fleet should be based on a combination of organizational, technological and personnel-related measures. The most important areas include the introduction of technical diagnostics, modernization of repair workshops, use of advanced methods for restoring parts, rational supply of spare parts and continuous improvement of the qualifications

of repair personnel. These measures make it possible to increase the technical readiness of agricultural machinery, reduce downtime, lower operating costs and ensure the timely performance of field operations.

Efficient repair and maintenance of the machine and tractor fleet contribute to the stability of agricultural production. When machinery is ready for work, farms can better comply with agrotechnical deadlines, reduce production risks and maintain the continuity of food production. Therefore, the development of an effective repair system should be regarded as one of the important technical factors in strengthening the country's food independence and increasing the resilience of the agro-industrial sector.

References

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Анотація: У тезах розглянуто шляхи підвищення ефективності ремонту машинно-тракторного парку як важливого чинника забезпечення продовольчої незалежності країни. Основну увагу приділено технічному діагностуванню, модернізації ремонтних майстерень, відновленню зношених деталей, своєчасному забезпеченню запасними частинами та підвищенню кваліфікації ремонтного персоналу. Підкреслено, що ефективний ремонт і технічне обслуговування підвищують технічну готовність сільськогосподарської техніки, зменшують простой та експлуатаційні витрати, а також забезпечують своєчасне виконання польових робіт.

Ключові слова: машинно-тракторний парк, ефективність ремонту, сільськогосподарська техніка, технічне діагностування, технічне обслуговування, продовольча незалежність.