

FACTORS AFFECTING THE PERFORMANCE OF MACHINE-TRACTOR UNITS

Б. Артикбаев

т.ф.ф.д., кат.и.х., Қишлоқ хўжалигини механизациялаш
илмий-тадқиқот институти, лаборатория раҳбари

ABSTRACT

Organizational-economic, technical, organizational-technological and sociological factors strongly influence the level of productivity of units. We study these factors by dividing them into separate groups and groups [1-9].

Organizational and economic reserves for increasing aggregate productivity: optimization of agroclusters and farm land areas, types and volumes of cultivated agriculture (types of machines required for mechanization of agrocluster and farm products production depending on the size of the land area and types of crops (driving, harvesting) and b.) and the quantities are determined);

optimization of the structure (composition) of the vehicle fleet in the balance of agroclusters and farms, district machine-tractor fleets (MTP) (the number of tractors, machines and combines is calculated on the basis of the criteria of productivity, economy and maximum annual performance of each machine. It should not be forgotten that the machines Both excess and deficiency of the standard will harm farms and MTPs);

ensuring optimal loading of machines throughout the year (agrotechnical seasons) (finding the number of aggregates required for each technological operation (plowing, planting, spraying, etc.) based on accurate calculations);

planting of repeated or intermediate crops on areas freed from main crops, including grain;
sharp increase in the shift (daily) productivity of units, because the use of 30-40% less than the rated power of the engine increases the specific fuel consumption by 10-12%);

strict adherence to the sequence of field work in agroclusters and farms (it is necessary to use technological cards in the cultivation of agricultural products), prepare, distribute and use aggregates for work in accordance with this sequence (machines work without damage, their loading level increases, the quality of work improves) ;

operational management of a separate car, a group of cars and the whole (entire) car park (use of cars in a detachment method, setting up dispatching service).

Technical reserves for increasing the productivity of the unit: improving the accuracy of machine details, nodes, especially working bodies (ploughshare, disk, blade, spindle, etc.) interacting with technological materials (soil, plants, etc.) (failures in the work process, especially sudden the number of breakdowns is sharply reduced, the use of shift time is K_{em} coefficient increases);

full use of tractor (engine) power (aggregation of the tractor with combined and comprehensive machines);

reduction of energy consumption in the work process (taking constructive-engineering measures to reduce mechanical resistance between the tractor transmission and the details of the walking chain);

movement along supporting planes on the permitted slope (working in fields with a normal slope angle);

reduce the share of aggregate movement (sequential execution of technological operations in adjacent fields);

not to allow the wheels to run erratically (do not operate in fields with mud or excessive moisture, tire treads and chain teeth not removed);

processing technological materials (soil, grain, cotton, etc.) with optimal moisture and hardness; to ensure smooth operation of rotating units on their supports, forward and reverse moving parts along the guides, correct adjustment of all technological cracks in the machine, timely lubrication of parts and units, etc.);

operating machines in optimal load-speed modes (choosing the number of plow bodies according to the nominal power of the tractor in the driving units; choosing the working speeds of the tillage and harvesting equipment based on the mechanical-physical characteristics of the soil in the field and the productivity of the crops, etc.);

equipping machines with stress-relieving and automatic devices (retaining clutches installed on cardan shafts, shearing bolts on plug racks, automatic sensors that report when the receiving chambers of the cotton picker are clogged with cotton, etc.).

Organizational-technological reserves for increasing the productivity of the aggregate:

preparation of fields for the operation of machines (the fields into which the driving aggregate enters must meet the following requirements: cleaned of cotton stalks, straw and other plant residues, the specified amount of local and mineral fertilizers applied to the soil, free of weeds with perennial rhizomes, soil moisture is around 16-18% [10]; quality indicators of cotton fields allocated for machine picking: the slope of the field surface, at most 1 0; the deviation of cotton bushes from the theoretical axis of the row, at most 3 cm; large lumps larger than 5 cm at the tops of the bolls should not be; the height of the cotton bush is around 80-100 cm; the degree of lying of the cotton bush is 1.5% at most ; weeds are not more than 5 pieces per 100 meters of the field; a blue leaf is allowed to remain on the cotton before the harvest, at most 3 pieces , dry leaf - 4 pcs., the degree of opening of the bolls in the cotton bush after defoliation is 80-90%, the moisture level of the cotton in the bush is 11% at most; the height of the location of the opened bosom at the bottom of the cotton bush in relation to the top of the bush, at least 8 cm; the width of the flat area prepared for turning the machine at the beginning and end of the field, at least 10 meters; all the cradles and cradles are leveled in quality [11]);

choosing the method of movement of the aggregate for a concrete technological operation (for example, it is effective to use the method of movement in the field during plowing, planting, cultivation, cotton harvesting, and the method of rotary movement during soil fertilization and grain harvesting);

adjusting the machines according to the parameters of the field agrophone (setting the driving depth individually for cotton, grain fields and paddy fields; choosing the width of the cotton picking machine according to the degree of opening of the bolls, etc.);

quality technical service (TSK) of aggregates in due time (perfect operation of aggregates is ensured during the shift, day and season).

Sociological reserves of increasing the productivity of the unit: placing each tractor, combine and machine in the hands of a knowledgeable, qualified mechanist;

equipping farms and agroclusters with machine sheds, MTP workshops with qualified plumbers, engineers and technicians;

management and repair of new equipment and training employees in the rules of shift and seasonal TCK;

timely payment of salaries, financial incentives for exemplary employees, protection of the work of mechanics and plumbers.

[7] the author of the literature suggested the following ways to increase the productivity of aggregates:

- 1) ensuring high shift and daily development;
- 2) strict adherence to agrotechnical requirements for the quality and duration of all technological operations in the cultivation of agricultural crops;
- 3) correctly equipping (arranging) aggregates by choosing the width of coverage of machines and speed modes during work, taking into account the maximum use of tractor power;
- 4) rationalization of shift time by means of progressive methods of movement of aggregates, mechanization of machines with seeds and fertilizers, repair of faulty machines in the field, maintenance of them here, organization of harvesting work in a squad manner, provision of continuity in the supply of spare parts and fuel and lubricants use;
- 5) organizing the work of aggregates according to the plan - routes;
- 6) to provide high-quality domestic service to mechanics, plumbers and engineer-technicians during the season, to encourage them financially;
- 7) introduction of dispatching service in each MTP, harvesting squad;
- 8) introduction of new technologies, modern equipment, repair and maintenance equipment to the production of agrocluster farms and MTPs.

[12] in the literature, in order to increase the productivity of units, achieving high shift work productivity (correct arrangement of units; full use of the power of the tractor and the coverage width of the machine; drastically reducing the time spent on technological stops, walks, corrections and maintenance, etc.), the time of using units during the day It was emphasized that extension (use of vehicles for 14-21 hours, i.e. 2-3 shifts) and full use of the vehicle fleet during the season (by increasing the load factor of the vehicle fleet) are important factors.

Thus, the results of categorizing and grouping the factors affecting the work productivity of MTAs are organizational and economic (optimization of land areas of farms, types and volumes of cultivated agricultural products; balance of farms, agroclusters and district machine-tractor parks (MTP)) optimizing the structure (composition) of the machine fleet; ensuring optimal loading of machines during agrotechnical seasons; strict adherence to the sequence of field work on farms; operative management of the work of individual machines, groups of machines and the entire (whole) machine fleet), technical (machine details, units) , especially improving the accuracy of the working bodies (coulters, disk, knife, spindle, etc.) that interact with technological materials (soil, plants, etc.); full use of the power of the tractor (engine); reducing energy consumption during the work process; smooth movement of the unit reduce the share; prevent the wheels from spinning; processing technological materials (soil, grain, cotton, etc.) with optimal moisture and hardness; ensuring that rotary moving nodes work without jamming on their supports, forward-reverse moving parts along the guides, correct adjustment of all technological slots in the machine , timely lubrication of details and nodes; use machines in optimal load-speed modes; equipping machines with stress-relieving and automatic devices), organizational-technological (preparation of fields for high-quality operation of machines;

adjusting machines on the spot according to field agrophone indicators) and sociological (putting each tractor, combine and machine in the hands of a knowledgeable and qualified mechanist; farm machine sheds , equipping MTP workshops with qualified plumbers, engineers and technicians; managing and repairing new technical equipment and teaching them the rules of shift and seasonal TCK; timely payment of wages, material incentives for exemplary employees, protection of the labor of mechanics and plumbers) ways of using reserves allows reasoning from theoretical and practical aspects.

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