UO'K (UDK) 631. 31.06.

EXPERIMENTAL RESULTS ON THE INFLUENCE OF THE LONGITUDINAL DISTANCE BETWEEN MODULAR PLUG BODIES ON THE QUALITY AND ENERGY INDICATORS OF PLUG WORK.

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Abstract. The article presents the results of an experimental study on the effect of the longitudinal distance between the modular plug housings for the main tillage of the soil on the quality and energy performance of the plug. In this case, the speed of movement of the aggregate, the depth of processing, the depth and completeness of burial of plant residues have achieved the required level of indicators.

Key words: Modular plug, housing, longitudinal distance between housings, processing depth, resource efficient, technology, energy, constructive.

The production of energy-resource-efficient and high-performance tillage machines occupies a leading position in the world.. « Globally, more than 1.6 mlrd hectares of land are cultivated annually for the cultivation of agricultural crops » considering, the development of high-quality and productive and energy-resource-efficient tillage machines and devices is one of the important tasks.

In the world, scientific-research works aimed at developing resource-saving technologies of basic land cultivation and the scientific basis of the technical means that implement them, as well as the effective use of high-power tractors are being carried out.. In this regard, it is considered urgent to conduct targeted scientific research on the development of the constructive scheme of the modular plow, which provides high-quality plowing of land with low energy consumption, and the justification of the parameters of the working parts that ensure resource efficiency in contact with the soil.

This article presents the results of field experiments in order to determine the optimal value of the longitudinal distance between the POT 01.000 bodies selected for the modular plug.

Table

Quality and energy indicators of plug work depending on the longitudinal distance between modular plug bodies

Indicators name	Value of indicators				
	L_1=700 mm	L_1=800 mm	L_1=900 mm	L_1=1000 mm	L_1=1100 mm
Movement speed, km/h	7,9	7,9	8,0	8,1	8,0
Processing depth, cm M_{sr} $\pm\sigma$	 34,7 2,3	 34,4 2,0	 35,1 1,7	 34,7 1,9	 34,8 2,1
Burial depth of plant remains, cm $M_{sr} \pm\sigma$	 11,3 6,9	 14,7 6,1	 17,4 5,2	 17,0 4,8	 16,1 5,3
Burial completeness of plant remains, %	84,8	91,0	96,1	96,1	95,8
Fertilization of the soil quality, % Size of fractions, mm greater than 100 100 – 50 less than 50	11,2 14,7 74,1	10,7 11,4 77,9	9,4 11,5 79,1	9,5 11,8 78,7	10,2 11,0 78,8
Specific resistance of the body, kPa	86,6	72,5	70,8	71,7	71,3

The longitudinal distance between modular plug bodies was changed from 700 mm to 1100 mm with an interval of 100 mm. The processing depth was set at 35 cm, and the unit speed was 8 km/h. The results obtained in the experiments are presented in the table.

As it can be seen from the given data, when the longitudinal distance between the bodies is increased from 700 mm to 900 mm, the burial depth and completeness of plant remains increased, the soil compaction quality improved and the body's tensile strength decreased. Later, when the longitudinal distance is increased to 1100 mm, these indicators almost do not change. This can be explained by the fact that when the longitudinal distance is less than 900 mm, the free passage of the soil slab between the casings is not ensured, and as a result, the technological process of the plug work is disturbed and it becomes blocked..

Changing the longitudinal distance between the bodies from 700 mm to 1100 mm had almost no effect on the processing depth and its uniformity.

Thus, in order to ensure that the overturned soil slab passes between the casings without disrupting the technological process of plow work, the longitudinal distance between them should not be less than 900 mm..

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