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RESULTS OF COMPARISON TESTS FOR CHOOSING THE TYPE OF ROLLER

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ABSTRACT

The article presents the results of the experimental studies on determining the optimal values of the roller of the plowed land and selecting its type on the basis of this. In experimental studies, the provision of complete processing of the field surface is ensured mainly by the selection of the type of roller and the planer for installation on the roller, in order to obtain the required level of moisture for seed germination according to agrotechnical requirements. It is noted that there are gear-plate, rod working parts. In order to verify these obtained results, we made plate, gear-plate, and rod coils, which have a constant diameter, and conducted experimental studies using them. In experimental studies, after using different rollers with a constant diameter, the influence of soil compaction, density and tensile strength was studied. In order to reduce the influence of various variable factors on the obtained results, the experiments were carried out on a specially prepared agro background, that is, it was first plowed and then leveled.

In order to test the theoretically based parameters of the roller selected for conducting experimental studies in field conditions, the bases of the roller with a coverage width of 1.5 m and fixed-diameter bases with slats, toothed-slats, and wire plates to be installed on them were developed. released and prepared.

Based on the results of experimental studies, the following can be noted: in order to ensure that the compaction quality and density of the soil meet the agrotechnical requirements, and to ensure that the rolling resistance is minimal, it is necessary to have a gear-plate roller.

KEYWORDS

Roller, plank, experimental, soil, fertilization quality, density, agrotechnical, theoretical, crop, seed, resource-efficient, technology, technique, scientific-technical, agrophone, diameter, combined, working body, border, recovery, wet, technological, radius, slip, coefficient, depth of immersion in the soil, length, thickness, soil fraction, resistance to traction of the coil, specific resistance, empirical, speed.

INTRODUCTION

In our republic, comprehensive measures are being taken to reduce labor and energy consumption, save resources, grow agricultural crops based on advanced technologies, and develop high-performance combined machines in preparation for planting grain and repeated crops, and certain results are being achieved. In the Strategy of Actions for further development of the Republic of Uzbekistan in 2017-2021, including "...modernization of agriculture, consistent development of production of agricultural products, further strengthening of food security of our country, high productivity "use of agricultural machinery" tasks are defined [2]. In the implementation of these tasks, including all technological processes for preparing the soil for planting (full compaction of the driving layer, leveling and grinding of the surface of the field) in one pass through the field, i.e. before planting One of the important issues is the development of a combined machine that provides comprehensive processing of teeth [1; 2; 3].

factors in the selection and justification of parameters of soil tillage machines, as well as in the assessment of their performance.

METHODS

Based on the analysis of the literature carried out for the purpose of choosing the optimal type of roller, comparative tests of planar, toothed planar and rod rollers were conducted.

In order to carry out comparative tests, flat, toothed flat and rod rollers with the same diameter of 40 cm and a coverage width of 1.5 m and a special frame (laboratory-field device) on which they are installed were developed, and their experiment was carried out. Copies were prepared [5; 6; 7; 8].

The laboratory-field device was designed to allow for the installation of different types of coils and the ability to vary the vertical pressure applied to them over a wide range.

Comparison trials were conducted in a post-harvest wheat field that was irrigated and plowed and surfaced with a machine equipped with disc rollers and a leveler. The tests were conducted in the third and fourth gears of the MTZ-80 tractor.

Soil moisture and hardness in 0-10 and 10-20 cm layers were determined according to the mentioned methods before conducting comparative tests of rolling mills. Their results are in the table given.

Table 1.

Soil moisture and hardness of the test site

Layer, cm	Soil moisture, %	Soil hardness, MPa
0 - 10	15, 8	0.71
10-20	14, 4	0.83
0 - 20	13.1	0.91

evaluation criteria, the compaction quality of the soil in the 0-10 cm layer, its density, and the tensile strength of the rollers were taken.

Tenzofingers were calibrated before and after the experiments. In this, they were given a load in the range of 0-5 kN with an interval of 1 kN. The results of the tests are presented in Table 2.

RESULTS

Based on them, the following can be noted:

- in terms of the quality of soil compaction, the toothed plate roller had higher

Table 2.

Results of comparative tests of different coils

Type of roller	Amount of fractions of the following size (mm), %			Soil density, g/cm ³	Pulling resistance of coils, N/m
	>50	50-25	<25		
V=6.2 km/h					
Planked	6.8	9.2	84.0	1.24	202

With toothed plank	3.4	7.2	89.4	1.22	228
Prutokli	9.6	9.1	81.3	1.25	193
V=8.3 km/h					
Planked	5.9	6.7	87.4	1.21	24 6
With toothed plank	2.3	6.1	91.6	1.20	24 7
Prutokli	9.5	7.8	82.7	1.22	218

indicators compared to the plate and rod rollers. A roller with a rod and a plate grinds the pieces a little less well than it. As a result, the amount of fractions smaller than 25 mm is 8.1-8.9 and 4.2-5.4 percent less, respectively, when processing with wire and plate rollers compared to processing with toothed plate rollers. The amount of fractions larger than 50 mm was 6.2-7.2 and 3.4-3.6% higher;

- the density of the soil was almost the same in all three coils;

- to draw a roller with a toothed plate according to the results of tensometry

the largest, and the coil with the wire provided the least resistance. This can be explained by the difference in the depth of their immersion in the soil.

It is clear that the roller with a toothed plate is buried deeper in the soil, and the roller with a rod is shallower [6; 7].

The increase in the speed of the unit from 6.2 km/h to 8.3 km/h led to the improvement of the quality of soil compaction, decrease in density and increase in the traction resistance of the rollers.

From the observations, it became clear that after the passing of the plate and toothed plate rollers, a soft layer of 3-4 cm thickness was formed on the surface of the field, which ensures the preservation of moisture in the soil. the layer was not sufficiently formed.

CONCLUSION

The plow is equipped only with disc rollers and a leveler, that is, when working with a machine without rollers, the soil does not meet the requirements for the planting background in terms of the quality of soil compaction, density and leveling of the surface part.

According to the results of the comparative tests, a toothed plate roller is recommended for installation on plowed land, and its parameters will be investigated in further studies.

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