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PRELIMINARY TEST RESULTS OF A COMBINED PRE-SOIL WORKING UNIT

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Abstract. This article provides information on the results of preliminary tests of a pilot copy of a comprehensive combined unit for pre-sowing tillage.

Login. One of the main tasks in the preparation of land for planting in the conditions of our republic is to level the surface of the field, compact it to the required level and crush the large lumps to form a soft soil layer before direct planting in order to ensure high-quality sowing of seeds and even germination [1].

In this regard, in Uzbekistan, S.N. Ryzhov, E.F. Yakovlev-Morozov, V.P. Kondratyuk, A.L. Tropkin, D.K. Azimov, M.U. Umarov, M.V. Mukhamedzhanov, S. Suleimanov, S. Aminov and R.K. Kurvantayev studied the effect of various soil densities in the plow layer on its physical, biological and other properties. They also studied the effect of soil density on the good growth and development of cotton and a sharp increase in productivity, and conducted scientific research to determine the optimal soil compaction values.

According to the analysis of the results of agrotechnical scientific research conducted by scientists, in order to obtain high cotton yields in the irrigated farming regions of our Republic, the soil density in the plow layer should be in the range of 1.1-1.3 g/cm3 [1].

However, due to the location of the Republic of Karakalpakstan in the northernmost region of the country, it takes 2-3 times more labor to cultivate the land than in other regions. The soil is dense due to the lack of humus in the soil and salt leaching. Several successive tillage operations with existing techniques lead to an extension of the planting period and drying of the upper part of the soil. This, in turn, leads to the death of seedlings.

Therefore, the creation of technical means of preparing the soil for sowing, suitable for the soil and climatic conditions of the Republic, and its introduction into agricultural production are one of the urgent problems of the present day.

All these requirements can be satisfied by creating a comprehensive combined unit that performs operations in preparing the soil for sowing in one go.

Main part. Based on this, an experimental copy of a comprehensive combined unit was developed and preliminary tests were conducted at the Department of "Agricultural Mechanization" Karakalpakstan Institute of Agriculture and Agrotechnologies "Agricultural Mechanization

Based on the research conducted and the analysis of scientific and technical literature, a field-experimental device was developed based on the constructive scheme of the improved soil pre-sowing tillage unit, and its technological operation was studied.

The comprehensive combined unit is mounted on a tractor in a suspended manner. The unit is equipped with a frame 1 with a suspension device, and the working elements mounted on it are arranged in three rows, with the first row consisting of softening blades 2, the second row consisting of smoothing zigzag-shaped flat cutting claws 3, and the third row consisting of compacting working elements 4 (Fig. 1).

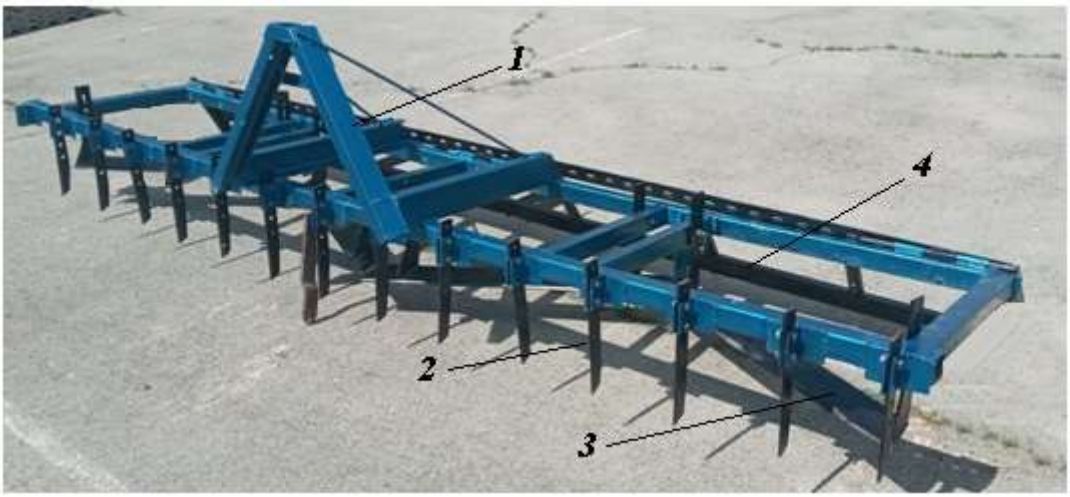

Fig. 1. An experimental version of a comprehensive combined unit.

The width of the unit is 3.6 m. Vertical 15-dona round-shaped pichoks, tekislovchi and zichlovchi working bodies are installed. The softening and reducing working organs are arranged in a zig-zag pattern when the softening and reducing working bodies are stretched over a long distance.

The aggregation of the data of the synovlari branch of Nukus is carried out in the region of Tumanida, where the main goal of the regional government is to increase the number of people living in the region.

The mean square deviation of field unevenness values, the level of soil compaction, i.e., the amount of fractions less than 25 mm in size, soil moisture and density were taken as evaluation criteria.

The appearance of the unit during the initial test is presented in Fig. 2.

Fig. 2. The appearance of the experimental unit in the working process.

Soil moisture and density in 0-10 and 10-20 cm layers were determined. The results of preliminary tests of them and the comprehensive aggregate are given in Table 1.

Table 1

Results of preliminary tests of comprehensive aggregate

№	Of the indicators designation	Values of indicators	
		According to preliminary requirements	By test results
1.	Soil moisture, %: - in the 0-10 cm layer - in a layer of 10-20 cm	 16-18 16-18	 16,8 19,5
2.	Fertilization quality of the soil, %: > 50 mm 25-50 mm < 25 mm	 no information no information >80	 5,7 16,0 80,3
3.	Density of soil in 5-15 cm layer, g/cm3	1,1-1,2	1,13
4.	Mean square deviation of unevenness on the field surface, cm: - in the direction of movement - cross the direction of movement by direction	 <± 2 <± 2	 ± 1,83 ± 1,66

Conclusions. In the initial tests, the experimental version of the combined unit reliably performed the specified technological processes, while the design and technological shortcomings identified during the tests were identified. In the future, scientific research work is continuing according to plan at the department in order to eliminate these identified shortcomings.

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