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FIELD CONDITIONS FOR PLANTING RE-CROPS WITH MINIMUM TILLING

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ABSTRACT

The article presents the results of a study of the physico-mechanical properties of the soil in the fields after harvesting crops. The advantages and peculiarities of the method of land cultivation, the Strip-Till technology, as well as search for the possibility of using it for the cultivation of re-crops in permanent furrows and in row spacing ridges. The data obtained as a result of experimental studies to determine soil moisture and hardness, as well as the quality of soil tilling by the recommended working bodies, are presented.

KEYWORDS: *Physico-Mechanical, Experimental, Moisture*

1. INTRODUCTION

Total work on further improvement of the system of crop placement based on soil and climatic conditions of the regions of The Republic, increasing the efficiency of land and water resources, sustainable enrichment of the domestic market, maintenance and cultivation of agricultural products to expand processing and export Great attention is paid to the timely and quality conduct of the complex [1].

It is known that the main and pre-sowing tillage is the most energy-intensive process in agricultural production, accounting for 40-50% of the total energy spent on the cultivation of agricultural crops in the country. Therefore, reducing energy consumption in the main and pre-sowing tillage of lands saves a large amount of fuel and lubricants in agricultural production, reduces labor costs and other costs, and increases the durability of machines and their working bodies. The result is a reduction in the cost of the product grown. One of the main ways to ensure energy efficiency in the cultivation of lands in the conditions of the republic is the use of combined aggregates [2].

Combined aggregates perform several technological operations on soil preparation and sowing in one pass. As a result, the negative impact of tractor motors on the soil is reduced, the quality and productivity of work is increased, the time of tillage is reduced and moisture is retained in it, and fuel and other costs are reduced. Combined aggregates used in tillage are based on the sequential installation of machines or working bodies that perform various technological processes in tillage, the use of which mainly leads to a reduction in the number of field passes of machine-tractor units.

Nowadays, after harvesting the grain crops, the land is plowed, prepared for sowing and then sown separately for the sowing of secondary crops. Most importantly, a lot of time is spent on pre-sowing preparation. As the soil moisture is low, it is necessary to irrigate the field before plowing. Then you have to wait 4-5 days until the soil matures, and only then begin to prepare the soil.

2. MATERIALS AND METHODS

Based on the scientific research, it is possible to perform several operations (land preparation, planting, etc.) in one pass by creating combined aggregates.

Minimal tillage with a combined unit, ie all technological processes of primary and pre-sowing tillage, without tillage and road tillage, and in one pass from the field, in order to prevent its over-compaction and structural damage and reduce labor, energy and fuel consumption. The development and widespread introduction of machines and aggregates [3,4,5,6,7] is a topical issue.

Field agrophony, physical and mechanical properties of the soil are of great importance in substantiating the parameters of such aggregates. With this in mind, the physical and mechanical properties of the soil in the fields where wheat was harvested, ie soil hardness according to the profile of the field (TST-Agro cluster in Lower Chirchik district of Tashkent region, Bobur femoral farm in Kamashi district of Kashkadarya region). In this case, soil hardness was measured at seven points along the slope profile (Figure 1).

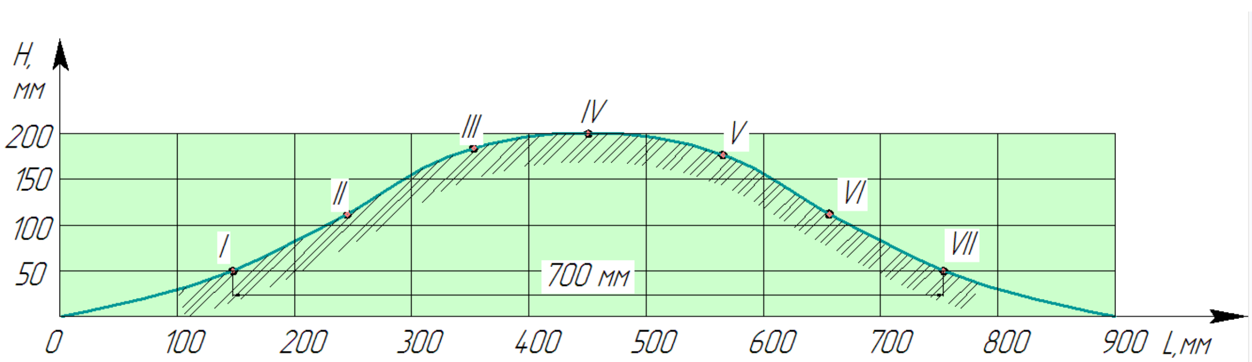

Figure-1. Furrow profiles.

Based on the results obtained, we create histograms on the profiles of the field of wheat sown in the open field and the field of wheat sown between rows of cotton (Figures 2,3,4,5).

3. RESULTS AND DISCUSSION

Based on the results obtained, we can conclude that in the wheat field planted between rows of cotton, the soil hardness of the egat profile is relatively less than in the open wheat field. As a result, a wheat field planted between rows of cotton is preferred for replanting.

Also, the results of research on energy-resource-water-saving technology of cultivation of agricultural crops in cotton and fallow lands and minimal tillage with a combined aggregate [8,9,10] bulk weight (density) and studied at depths of 0 to 10 cm, 10 to 20 cm, and 20 to 30 cm before processing (Table 1). The result showed that the volume weight value at the top of the egat profile was low.

The results obtained are given in the table 1.

TABLE 1

Points marked on the furrow profile	A field of wheat planted in the open	A field of wheat planted between rows of cotton	A field of wheat planted in the open	A field of wheat planted between rows of cotton	A field of wheat planted in the open	A field of wheat planted between rows of cotton	A field of wheat planted in the open	A field of wheat planted between rows of cotton
	10 cm		15 cm		20 cm		25 cm	
	Hardness indicators, MPa							
1	1,88	3,61	2,20	3,86	2,23	3,86	2,43	3,86
2	3,15	2,27	3,19	2,44	3,19	2,52	3,19	2,61
3	3,29	2,84	3,29	3,06	2,23	3,86	3,29	3,06
4	2,20	1,00	2,57	1,36	2,85	1,78	2,98	2,14
5	1,84	2,76	2,21	2,97	2,41	3,19	2,41	3,19
6	2,47	2,80	2,49	3,03	2,56	3,03	2,71	3,03
7	2,56	2,45	2,79	2,70	3,04	3,08	3,04	3,08

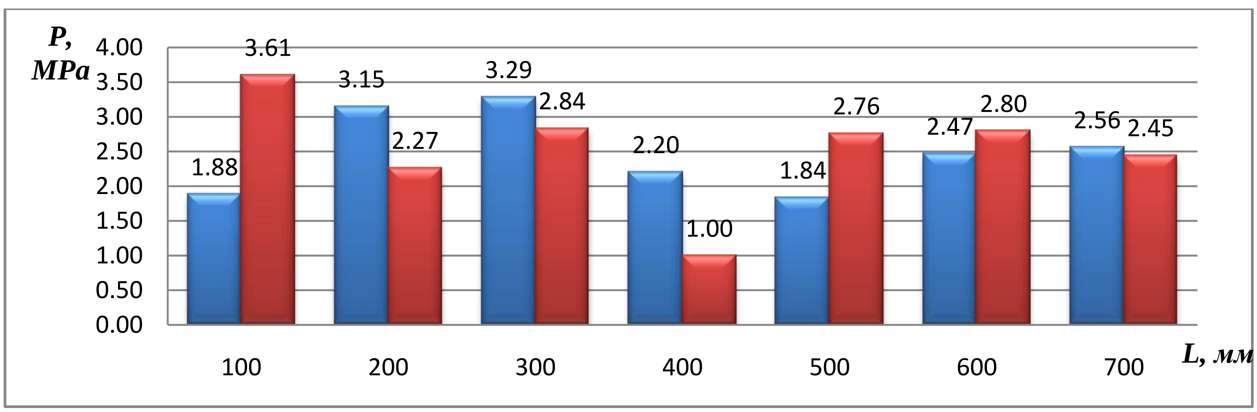

Figure 2. Up to a depth of 10 cm on the profile of furrow hardness indicators

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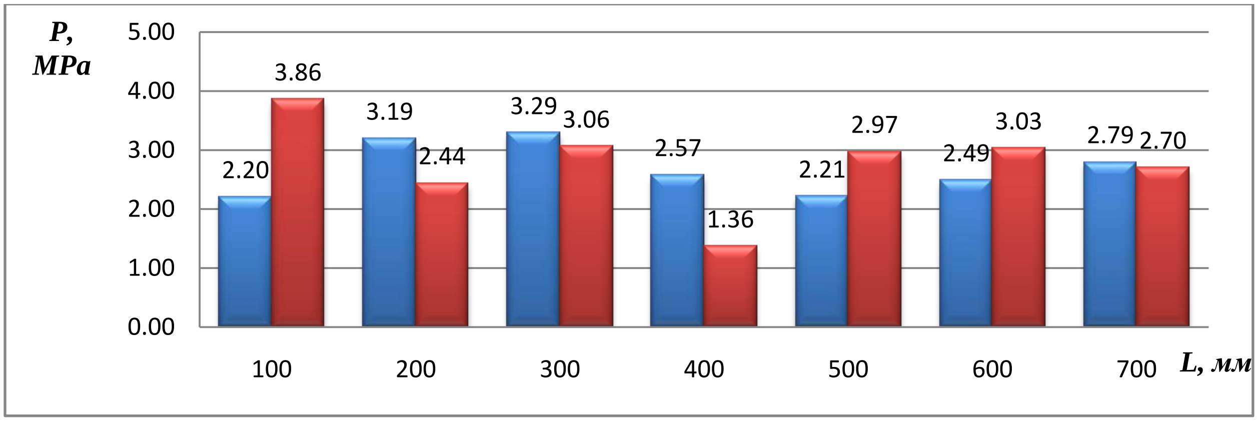

Figure-3. Up to a depth of 15 cm along the profile of the furrow hardness indicators

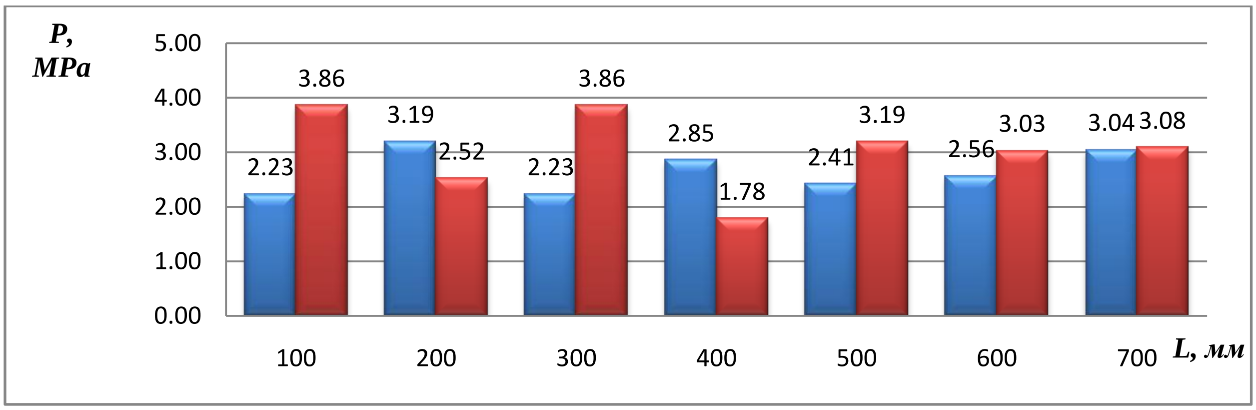

Figure-4. Up to a depth of 20 cm along the profile of the furrow hardness indicators

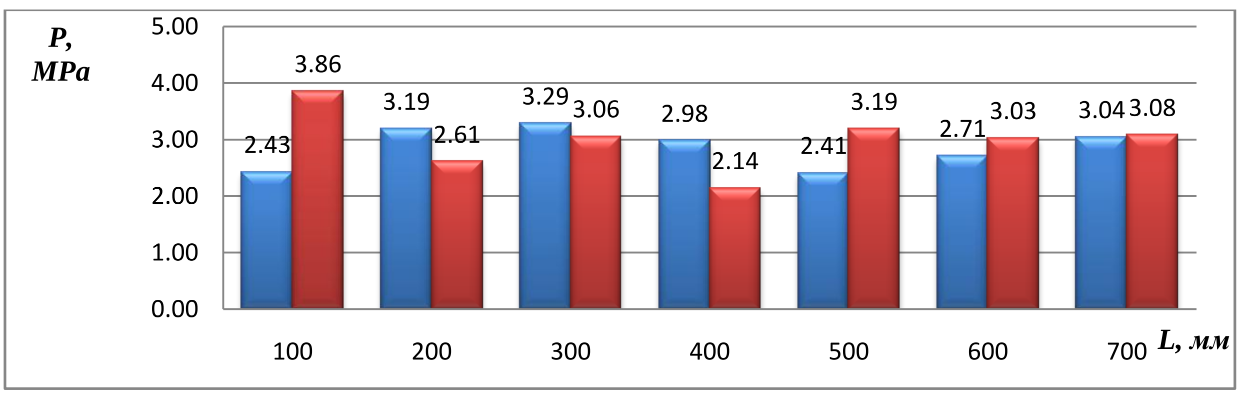

Figure-5. Up to a depth of 25 cm along the profile of the furrow hardness indicators

TABLE 2 VOLUMETRIC WEIGHT (G/CM^3) OF FIELD SOIL FREED FROM WHEAT BEFORE PLANTING AND PROCESSING.

Horizontal, cm	Indicators	Sample location		
		Marza	Side of furrow	Rut
0-10	M_{av}., g/cm^3	1,07	1,02	1,11
	σ, g/cm^3	0,03	0,02	0,04
	V, %	2,8	2,0	3,6
10-20	M_{av}., g/cm^3	1,13	1,15	1,19
	σ, g/cm^3	0,08	0,05	0,03
	V, %	6,6	4,3	2,5
20-30	M_{av}., g/cm^3	1,17	1,20	1,21
	σ, g/cm^3	0,03	0,03	0,02
	V, %	2,8	2,8	2,0

Soil moisture and hardness were also banned at depths of 0 to 10 cm, 10 to 20 cm, and 20 to 30 cm (Table 3). According to the experimental results, the soil moisture in the upper part of the slope profile (0-10 cm) was 5.4-6.1%. This indicator is not sufficient for seed germination. At the bottom of the Egat profile we can see that the soil moisture is 11.7-12.5%. Soil hardness was 3.8-4.02 MPa at the top of the egat profile and 5.32-5.45 MPa at the bottom.

TABLE 3 SOIL MOISTURE AND HARDNESS AT THE EXPERIMENTAL SITE

Horizontal, cm	Sample location		
	Marza	Side of furrow	Rut
0-10	5,4/3,80	6,0/3,93	6,1/4,02
10-20	9,8/5,10	10,2/5,14	10,5/5,19
20-30	11,7/5,32	12,2/5,39	12,5/5,45

Note. In the figure-soil moisture is at%

in the denominator - soil hardness is atMPa

4. CONCLUSION

To determine the mass of straw in the experimental plot, 1m2 of straw residue was collected from each suitable site. Calculations showed that the mass of straw on the experimental plot was 4.2 t / ha and the coefficient of variation was 15.6%.

In addition, research on resource-efficient agrotechnologies of perennial tillage [11] shows that the impact of resource-efficient agrotechnologies on the agrophysical and agrochemical properties of the soil, changes in its mechanical composition, evaporation of soil moisture and water permeability properties require the development of new tillage aggregates in the cultivation of secondary crops.

The above scientific research also shows that the planting of secondary crops requires the development of energy-saving aggregates for field preparation.

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