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STUDYING THE WIDTH OF PROTECTION DURING CULTIVATION

Doctor of Philosophy of Technical Sciences (PhD)

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Abstract. Initial processing between rows of cotton is one of the most important agrotechnical requirements, and the future fast or slow development of cotton depends on the quality of this activity. This activity is carried out with the help of cultivators, and the composition of their working bodies must first be correctly selected in accordance with the soil type of each field, and then adjusted in accordance with the established technological process. In this case, of course, there is a fixed value of the protective width-distance between a row of plants and the working bodies. Increasing the width of this protection reduces the efficiency of cultivation, and excessive narrowing causes more damage to young cotton seedlings. This article talks about recommendations for studying the width of protection during the primary processing of cotton rows.

Keywords. Cotton row spacing, protection width, initial processing, adjustment, soil, lateral deformation, sphere radii, flat blade, disc diameter, processing depth.

One of the important considerations for protection is the side of the soil under the influence of the cultivator and the distance of its spread, whether it is longer or shorter depends on the type and shape of the working organ, as well as the type of soil and the depth of reinforcement is. The general recommendations given by scientific institutions and experts are not suitable for all conditions, especially for cultivated areas with heavy soil.

According to the above-mentioned considerations, in order to further study this issue, a number of experiments were conducted with working bodies used in the

initial cultivation of cotton and allowing to narrow the width of protection during the years 2018-2023. The experiment was carried out with one-sided flat blades (razors) with a coverage width of 165 mm and spherical radii with the same outer diameter of 260, 300, 340, 380 mm, i.e. discs with a diameter of 355 mm, and a large diameter of 300 mm. soil deformation with conical rotary working bodies was studied.

The description of the soil of the cultivated fields where the experiments were conducted is presented in Table 1, and the experimental options and their results are presented in Table 2. The method of Professor M. Kh. Pigulevsky was used to determine the amount of soil deformation.

Table 1

Hardness and humidity in layers where lateral soil deformation is studied

Soil layers, cm	Soil hardness, n/cm2	Soil moisture, %
0-5	48-54	11-13
5-10	112-116	15-16
10-15	148-155	16-18

According to the results of all the tested options, the soil is significantly less deformed under the influence of the disc compared to the deformation under the influence of the blade and conical rotary working body. For example, in variant 1, soil deformation under the influence of a disk with a diameter of 260 mm is 1.9 cm, under the influence of a blade this indicator is 3.3 cm, and under the influence of a conical rotary working body - 2.4 cm. is forming (Table 2).

In the 1st variant of the experiment, the influence of the change in the diameter of the disc on soil deformation was studied. In this case, the deformation of the soil increases with the increase in the diameter of the disk. For example; soil deformation for a disk with a diameter of 260 mm is 1.9 cm, and for a disk with a diameter of 380 mm, this indicator is 3.1 cm.

In the 2nd variant of the experiment, the influence of the change of the disk installation angle on soil deformation was studied. In this case, the deformation of the soil increases in accordance with the increase of this angle. For example, when this angle is 50, soil deformation is 1.9 cm, and when it is 200, soil deformation is 3.4 cm.

In the 3-4 variants of the experiment, it was found that with the increase in the depth of processing and the speed of aggregate movement, the deformation of the soil increases correspondingly, and the deformation of the soil increases accordingly. For example, in option 4, when the speeds were increased from 0.8 to 2.6 m/s, soil deformation under the influence of a disk with a diameter of 260 mm increased from 1.9 to 2.8 cm, and under the influence of a blade it significantly increased, or increased from 3.3 cm to 4.9 cm.

Table 2

Kultivator ish organlari turi va o'lchamlariga qarab tuproqni yon tomonga deformatsiya miqdorining o'zgarishi

Option number	Disc diameter mm	Disc mounting angle, grad	Processing depth, cm	Movement speed m/s	The amount of lateral deformation of the soil in cm		
					Type of work body		
					knife	disc	Conical rotary
1	260	5	7	0,8	3,3	1,9	2,4
	300	5	7	0,8	3,3	2,3	2,4
	340	5	7	0,8	3,3	2,7	2,4
	380	5	7	0,8	3,3	3,1	2,4
2	260	5	7	0,8	3,3	1,9	2,4
	260	10	7	0,8	3,3	2,4	2,4
	260	15	7	0,8	3,3	2,8	2,4
	260	20	7	0,8	3,3	3,4	2,4
3	260	5	5	0,8	2,8	1,5	2,0
	260	5	7	0,8	3,3	1,9	2,4
	260	5	9	0,8	4,2	2,4	3,0
	260	5	11	0,8	5,0	3,0	3,8
4	260	5	7	0,8	3,3	1,9	2,4
	260	5	7	1,3	3,6	2,2	2,6
	260	5	7	1,7	3,9	2,3	2,8

	260	5	7	2,1	4,4	2,5	3,1
	260	5	7	2,6	4,9	2,3	3,5

Therefore, according to the above results of the conducted experiments, it is possible to increase the efficiency of cultivators by narrowing the width of the protection during the initial treatment between the rows of cotton:

- Spherical disks with a diameter of 260 mm should be installed on the cultivator in the initial cultivation of cotton..

- disks should be placed on both sides of cotton rows at a distance of 7...8 cm with the surface side, and the cutting edge of the disk should be set at an angle of 8...100 to the direction of aggregate movement.

As a result of the application of these recommendations in the initial cultivation of cotton, the efficiency of the use of cultivators can be increased by 8...12%..

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