EXPERIENCE RESULTS OF SOFTENING DISC NEAR THE GRADER SCOOP

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Abstract: *The article presents the results of laboratory experiments to determine the productivity and some other parameters of the disk working body, working with the scheduler bucket in order to improve the process of leveling fields that meet the agrotechnical requirements of pre-sowing background.*

Key words: *productivity, disk, bucket filling coefficient, disk diameter, drawing prism. water saving, furrow irrigation, disk space, innovative technologies, the mechanic, long-base scheduler.*

Introduction

Until now, the slopes have been used to straighten the area with the bulldozer type, especially the bottom of the open ground, which has two sides. It is produced by three or more transplants of a tractor unit to form a plane that is required to smooth the area of cultivation with such working bodies [1,2]. This leads to the density of the soil and, as a result, it cannot satisfy the agro technical demand of crop areas. After cultivation of crop areas are required extra softening before planting.

It is possible to achieve a reduction in the number of traces by improving the process of soil alignment, which will occur in front of the stabilizer. In order to achieve this goal, it was determined to set the crosswise parts of the stabilizer and determine the results of the experiments [3]

The experiments were carried out on the average sandy areas of the irrigated mechanical composition of Bukhara region. The purpose of the experiment is to determine the process of the working disc, which is mounted on the base plateau, the structure of the soil, the hardness of the field layer, the hardness, soil aggregate content, planning of field surface and the resistance of the aggregate at different frequencies[17,18,19,20].

Materials and methods

The process of technological working piece of the softening disc, which is mounted on the base plateau

The observation of the soft disk's working technology indicates that the soil formed before ladle also softens to a certain depth by means of discs, and the disc itself acts around its arrow. During the aggregate movement, the disks on the leveling stack are placed in half the opposite side of each other, ensuring that the soil is uniformly distributed around the width of the ladle. This positively affects the planning of the flat area. Fragments of soil rotating around disks crush large crates as a result of friction, and the aggregate composition of the soil planting layer improves. The change in the aggregate speed from 0.69 to 2.08 m / s will improve the above processes and will ensure the agro technical requirements before the physical and mechanical composition of the soil in irrigated lands [7,21].

It has been investigated during the experimental study that the transformation of the tensile aggregate at the different velocities of the soil coil has been investigated and it can be seen that the cross-sectional surface of the soil coil varies according to the speed and the cross-sectional profile is reduced at high speeds.

This is due to the intensive loading of near the scoop soil at the high speeds of the aggregate. At low frequencies, the aforementioned process is relatively slow, improves soil softening, and there is almost no observing lump density of the casing. The upper part of the coat formed with the upper part of the arched soil is expanded relatively, and the soil aggregate relative to the large velocities at smaller speeds of the flattening unit. It was also observed that the agility of the disc rotation in the case of the aggregate at high speeds between the ground discs does not necessarily depend on the moisture, and the smooth movement of the soil does not occur. This requires a separate study of the discs relative to each other and the diameter of the discs. The results of determining soil hardness, bulk weight, and aggregate content depending on aggregate motion velocity are given in Tables 1,2 and 3 below[8,9,14,15].

As can be seen from Table 1 below, as the speed of movement increases, soil hardness decreases when trimming and spreading the soil. The difference in soil hardness varies at minimal and maximum speeds: 0-5 sm to 23.5 N / sm^2 or 36.2% for horizontal; 5-10 to 18.2 N / sm^2 or 23.5% for horizon, 10-15 sm for horizontal - 8.5 N / sm^2, or 9.6%. The average depth of 15 sm is 17.8 N / sm^2 or 22.7%. As the depth increases, the difference in soil hardness varies between minimum and maximum speeds [12,13].

Such a change is also observed in the process of diffusion of soil hardness at different speeds of the unit. But where the soil hardness is smaller than the number of crops.

Because the soft disc device does not extend the whole soil to the soil and the soil pressure is not spread, but partly due to the reduction of soil fertility. Loss of soil hardness at the minimum and maximum speeds of the aggregate during diffusion is as follows: For 0-5 sm horizont - 12 N / sm^2 or 36.4%, for 5-10s of horizonte - 18.5 N / sm^2 or 35.9%, 10-15sm horizontal - 21.5 N / sm^2 or 30, 1%. The average depth of 15 sm is 14.1 N / sm^2 or 19.3% [16].

Density of soil depending on speed movement of softening disc fixed on base land grader

1-table

Horizons,sm	Soil wetness, %	Soil hardness, N/sm^2					
		Before passing	After passing				
			Prevailing speed, м/c				
			0,69	1,05	1,44	1,8	2,08
Cutting							
0-5	10,98	38,9	65,0	65,5	54,8	41,5	41,5
5-10	12,80	53,5	78,0	75,0	65,9	62,5	59,8
10-15	15,56	75,5	88,5	87,0	83,0	81,5	80,0
Average 15sm deepness	13,08	56,0	78,2	75,8	67,8	61,9	60,4
Spreading							
0-5	10,98	35,5	33,0	25,0	23,0	23,5	21,0
5-10	12,80	50,5	52,5	40,0	39,0	35,8	34,0
10-15	15,56	70,0	71,5	63,5	59,3	50,3	50,0
Average 15sm deepness	13,08	52,1	52,4	42,8	40,5	36,5	35,0

Studies show that increasing the acceleration of the leveling aggregate leads to a reduction in the weight of the soil. Table 2 shows the change in the weight of the soil depending on the speed of the working body. As shown in the table, the weight of the soil decreases with the increase in the speed of the aggregate. The values obtained are 0.69 to 2.08 m / s progressive, and are compatible with other driving frequencies and agro technical requirements. The weight of the soil at the minimum and maximum speeds during the cutting of the gradient aggregate is the following: For 0-5 sm horizontal - 0.179 g / sm^3 or 12.8%, for a 5-10 sm horizontal- 0.137 g / sm^3 or 9.7%, for a 10-15 sm horizon - 0.123 g / sm^3 or 8.34%. The average depth of 15 sm is 0.146 g / sm^3 or 10.2%.

The above analysis shows that the weight of the soil through the maximum and minimum speeds decreases with the increasing of depth. In this case when the weight of the soil changes, depending on the speed of movement. The difference in the weight of the soil differs from the minimum and maximum speeds in the range of 0-5 sm horizontal - 0.80 g/sm^3 or 6.3%, for 5-10 sm horizontal - 0.4 g/sm^3 or 3.12 %, For 10-15sm horizontal - 0.52 g/sm^3 or 3.77%. The average depth of 15 sm is 0.05 g/sm^3 or 4.38%.

Changing of soil weight depending on speed movement of softening disc fixed on base land grader

2-table

Horizonts, sм	Soil wetness, %	Soil weight, g/sm^3					
		Before passing	After passing				
			Prevailing speed, m/s				
			0,69	1,05	1,44	1,8	2,08
Cuting							
0-5	12,48	1,121	1,400	1,349	1,270	1,262	1.221
5-10	14,80	1,155	1,412	1,315	1,314	1,303	1,275
10-15	16,18	1,265	1,473	1,406	1,381	1,399	1,350
Average 15sm deepness	14,49	1,180	1,428	1,357	1,322	1,321	1,282
Spreading							
0-5	12,48	11,21	12,70	12,50	12,21	11,95	11,90
5-10	14,80	11,55	13,15	13.20	12,90	12,89	12,74
10-15	16,18	12,65	13,81	13,92	13,53	13,40	13,29
Average 15 sm deepness	14,49	11,80	13,22	13,21	12,88	12,74	12,64

It is known that the aggregate composition of soil is one of the main quality indicators in the cultivation of agricultural crops. Therefore, when analyzing soil faction changes in the study, the same process has also been observed that increasing aggregate flow rates leads to crushing and fertilization of soil fractions, which can lead to soil erosion.

Table 3 shows the change in the aggregate composition of the soil, depending on the travel speed of the softening disc [4,5].

Changing of soil aggregate composition depending on speed movement of softening disc fixed on base land grader

Speed movement, m/s	Fraction quantity, % mm			
	100 -50	50 - 10	10 - 0,25	< 0,25
Before passing aggregates				
	28,62	50,82	19,42	1,72
After passing aggregates				
0,69	28,41	48,38	20,25	2,59
1,05	26,81	48,81	24,36	1,92
1,44	19,76	47,73	30,17	2,21
1,8	16,00	50,72	30,25	3,05
2,08	13,41	47,98	34,99	3,69

As you can see from the table above, the large working sheets (Ø100 - 50mm) are crushed, and the average sheets (Ø50 - 10mm) are almost unchanged - with the middle cuticle cutters moving to smaller shapes. Microstructure aggregates (Ø 10 ... 0.25mm) increase. Minimum and maximal movement rates of soil fractions in the table are as follows: large sheets Ø 50 - 10mm - 52.8%, and average Ø 50 - 10mm thick content remain almost unchanged. Required small size aggregates (soil fractions) increase by 72% in Ø 10 - 0.25 mm. The composition of the fraction is nearly the same size as Ø <0.25 mm and has changed within the limits of these allowed agro technical requirements [12].

The results of the above studies will ensure that the irrigated land will be satisfactorily provided before planting, and will reduce the cost of the machinery needed to crush large and average cuts on the background of planting. One of the key factors in the study of the technological processes of the alignment aggregate aggregate is to improve the leveling of the longitudinal profile of the tread area.

The change in the level degree of the longitudinal profile of the field, depending on the aggregate velocity, is given in Table 4.

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4-table

Leveling degree	Speed movement, m/s				
	0,69	1,05	1,44	1,8	2,08
$\sigma_д$	9,94	11,05	10,80	10,30	10,10
$\sigma_п$	7,89	8,27	7,32	6,82	6,84
К (%)	20,6	25,1	32,2	33,8	32,2

$\sigma_п$ - The mean arithmetic mean of the average squared deviation of the sd - plane, sm; sp - so after the self-leveling pad, sm; K - degree of leveling. As shown in the table, the extent of the profile of the longitudinal profile, which is gradually increased with the progression of the disk worker leveling plate, increases. This will result in the crushing of the large casing of the stone in the work of the disks made from the half of the hull in an ax. The velocity of the aggregates at 1,8 ... 2,08 m / s has a higher level of leveling than other speeds [6]. This situation is characterized by the steady work of the working body at high speeds. Moreover, the increase in the speed of the above-mentioned border leads to crushing of large and medium-sized casing of stone. Working position of the softeners ensures that the soil is evenly distributed in the transition width, which improves the quality of the plane. One of the main objectives of the experimental research program is to determine the glare resistance of the recommended softening disk worker leveling device[10,11].

Results and Discussion

The results of the experiments the study of the dependence of the softening disk worker leveling device on resistance to gravitational pulling are discussed in Table 5.

Changing of grader weighing resistance according to speed.

5-table

Speed movement, m/s	0,69	1,05	1,44	1,8	2,08
Traction resistance, KN	3,32	3,59	3,95	4,20	4,60

Based on the above-mentioned theoretical research and calculations are shown that softening disc device, which fixed in base grader ,has been designed using a high level of flattening, has low energy efficiency and low energy consumption. Based on the results of the research, the following should be noted.

1. Observation of the technological process of the working platen workpiece indicates that the aggregate during the movement is uniformly distributed along the grinding and grooving widths of the soil slabs. Increasing movement speeds up to 2.08 m/s will help intensify the above processes, which will result in improved quality of the aggregate composition of the soil and improve the quality of the leveling.

2. The change in the speed of the working platter from the softener up to 0.69 to 2.08 m/s causes the soil hardness to decrease. At minimal and maximum speeds, the soil hardness at 0-15 sm depth is 17.8 N / sm^2 or 22.7%, while the spread is 17.4 N/sm^2 or 32.2%.

3. Movement speeds from 0.69 to 2.08 m/s will reduce the weight of the soil. The planting layer is reduced from 1.4 to 1.221 g / sm^3 or 12.8%. At the same time, the

relative decrease in the weight of the soil ensures that the pre-planting layer meets the agro technical requirements.

4. Changing movement speed from 0.69 to 2.08 m/s causes change in the aggregate composition of the soil. Large sheaths are reduced by 52.8%, with moderately unchanged middle cuts being characterized by the fact that the large cage has become smaller in the middle ribs and smaller middle cuts.

5. Increased movement speed from 0.69 to 2.08 m/s will increase the level of linearization, which will be achieved by crushing the large crates of soil and at high speeds of the unit.

6. Further research is designed to examine the size of the softening disc and the effective use of a softening cloth.

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