

### The Results of Laboratory Studies of a Disk Device Mounted on the Front of the Base Leveler

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#### Article Information

**Received:** April 18, 2023

**Accepted:** May 19, 2023

**Published:** June 20, 2023

**Keywords:** *productivity, disk, bucket filling coefficient, disk diameter, drawing prism*

#### 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.*

#### INTRODUCTION.

The Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated February 24, 2014 No. 39 "On additional measures to ensure the unconditional implementation of the State Program for the improvement of the ameliorative state of irrigated land and rational use of water resources for 2013-2017" was adopted [1]. One of the technologies used to enforce this solution, i.e. crop irrigation, efficient use of water resources, is a smooth surface. It can be concluded that the area of machine-tractor units is even, if the landing area is above the plane of the surface.

Accurate and reliable aggregate performance will improve their business efficiency and quality of work. In order to increase the leveling efficiency of the land based on its underwire buckets, spherical disks are installed in order to analyze optimal size models and laboratory experiments. We have developed disk drives of the following diameters: 150 mm, 120 mm, for experiments in a soil channel with a workstation from a recycled disk. The experiments were performed in triplicate and at three speeds (0.25 m / s, 0.58 m / s, 0.80 m / s).

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In order to identify the optimal variant of the disk disassembly scheme, vertical and horizontal slots (grooves) were made on the sides of the pile.

According to the results of the experiment, the dependence of the soft disk device model on the diameter and speed of the disk was investigated. Laboratory studies also show that increasing the layout increases with increasing diameter, distance and speed of the disks in the model. Studies have shown that the process of forming a ground coating on a dirt channel occurs several times slower than in field conditions. There was no destruction of the disk between the disks by increasing the speed of movement of the base device to the base station of the ground channel by 0.80 m / s, on the contrary, the level of crushing increased. In addition, if the height of the ground cellar exceeds 5 cm, the smooth movement of the hard disk to the ground leveling plane will deteriorate. At the same time, part of the soil inside the puddle falls from the side and rear walls, which reduces the quality of the drift plane in the soil channel. Analysis of the research results showed that several effective disk characteristics were found with a diameter of  $D_d = 150$  mm.

Laboratory results also show that the efficient operation of model workstations of a disk device, which softens the base plate, is associated with the optimum displacement of disks. We changed the disk space by tilting it. Optimized disks in disks are the displacement of disks with soil, minimization of the walls of the side and rear sides, as well as the smooth displacement of the soil in the heap. studying the soil coagulation process based on the speed of the drive model and analyzing photos taken with a fast merging photo demonstrated that the discriminating organization works more efficiently ... When the distance is 20%, the distance between the disks should be  $L \leq (2 \dots 3) D_d$

The angle of inclination of the disk space is of great importance for the horizontal plane. This is due to the fact that the inclination of the disk on which the disk was rolled should be flattened and crushed. According to the literature, the natural angle of soil inclination [4] should be from 40 to 50, based on the physical and mechanical properties of the soil. However, observations have shown that the length of the slope of mountaineering in motion is less than the length of the slope of the stop line. Thus, the slope of the leveling of the soil is much greater than when driving. Given the above analysis, we assume that the slope of the motion of the soil is 55... 65 . The corner of the slope depends on the physical and mechanical properties of the soil and the moisture content. This corresponds to the results of experiments conducted on the soil channel. As can be seen, the inclination of the disk surface should correspond to the straight line of the soil coil and should be not less than 50 ... 100 mm below the center of the soil. These indicators depend on the speed and humidity of the pile (speed  $y = 0.25 \dots 0.80$  m / s, humidity  $W = 14 \dots 20\%$ ). If this speed and humidity exceed working quality, the soil will not even soften between the discs.



**Picture-1. A mockup of a data table model that simplifies alignment on land.**

Soil moisture, its hardness, weight and composition of soil aggregate were determined by three layers at a depth of 10 cm before and after crossing the groundwater channel of the disk device, which softens to the ground plane. The following tables show the measurement results . (Tables

1, 2, 3)

**Table-1. The change in the hardness of the soil depending on the speed of movement of the working body on the disk of the device softens to the base of the plateau.**

Horizontes, sm	Soil moisture, percentage calculation	hardness of the soil, kg/cm <sup>2</sup>			
		Until the passage of aggregate	Speed moving of aggregate after the passing m/s.		
			0.25	0.58	0.80
Getting cut the height of soil					
0...5	16,48	3,35	6,40	6,42	6,0
5...10	17,62	5,05	8,30	8,50	6,3
Feeling the depth					
0...5	16,48	3,5	3,0	2,5	3,2
5...10	17,62	5,6	4,5	3,3	3,9

**Table -2. Depending on the velocity of the moving body of the working body, the disk device that softens the base plate to change the weight of the soil.**

Horizontes, sm	The weight of the soil, g / cm <sup>3</sup>			
	Until the passage of aggregate	Speed moving of aggregate after the passing m/s.		
		0.25	0.58	0.80
0...5	1,41	1,42	1,41	1,40
5...10	1,43	1,43	1,42	1,41

**Table-3. The change of the composition of the soil aggregate, depending on the speed of movement of the working organ on the disk device softening to the base plateau.**

Movement speed, m / s	Amount of Fractions, %		
	∅ 10...5MM	∅ 5... 0,25MM	∅ < 0,25MM
Untill the passing of aggregate			
	59,1	28,89	11,19
After the passing og aggregate			
0,25	57,8	29,72	12,06
0,58	56,91	33,26	9,72
0,80	54,23	36,67	8,71

**Table-4. Change of leveling profile of the longitudinal profile, depending on the velocity of movement of the working body by the disk device softening to the base plateau.**

Tendency Indicator	Movement speed, m / s		
	0,25	0,58	0,80
$\sigma_0$	9,91	11,05	10,80
$\sigma_n$	8,6	9,37	9,02
K (%)	13,21	15,2	16,48

As can be seen from the table, soil hardness, volume and aggregate content will vary at a rate of 0.25 ... 0.80 m / s and a relatively small amount of moisture content. This change corresponds to the agrotechnical requirements before planting. Table 4 shows that aggregate velocity increased from 0.25 m / s to 0.80 m / s, whereas the level of longitudinal profile of the ground canal increased by 19.84%. This change confirms the theoretical results. A smooth disc leveling device based on the slope, the slope of the soil heap from the soil surface should be parallel to the line and the middle of the pile should be placed at least 50 ... 100 mm. These indicators depend on

the speed and humidity of the pile (speed  $y = 0.25 \dots 0.80$  m / s, humidity  $W = 14 \dots 20\%$ ). This speed is reduced, and the humidity improves the quality of work, and the soil is blocked on the surface of the disks. In summary, we can say that the above points and analyzes show that the qualitative leveling of land in improving land reclamation is of utmost importance.

#### USED LITERATURE:

1. М.Ахмеджанов.Планировка орошаемых земель.Ташкент.,«Мехнат»,1991,с.52.
2. И.С.Хасанов,П.Г.Хикматов.«Изучение эффективности применения планировочных машин и выбор типа орудия для фермерских хозяйств Бухарской области.Доклады международной научно-практической конференция.ТошДУ.,Тошкент, 2003, с.221.
3. Atamurodov, B. N., Ibodov, I. N., Najmiddinov, M. M., & Najimov, D. Q. The Effectiveness of Farming in the Method of Hydroponics. *International Journal of Human Computing Studies*, 3(4), 33-36.
4. Сатторов, Ш. Я. (2020). Use of aerocosmic methods and gis programs in construction of space data models of pastural land. *Актуальные научные исследования в современном мире*, (5-4), 16-22.
5. Kurbanmuratovich, M. R., Jalilovich, K. J., Ugli, I. I. N., & Ugli, N. M. M. R. (2021). RESULTS OF APPLICATION OF SOFTENING SPHERICAL DISC WORKING ORGANNI IN FRONT OF THE BASE SMOOTHING BUCKET. *ResearchJet Journal of Analysis and Inventions*, 2(07), 14-22.
6. Juraev, F. U., Ibodov, I. N., Juraev, A. J., Najimov, D. K., & Isoyeva, L. B. (2021, October). Development of procedures for corn variets irrigation as main crops. In *IOP Conference Series: Earth and Environmental Science* (Vol. 868, No. 1, p. 012089). IOP Publishing.
7. Juraev, F., Khamroyev, G., Khaydarova, Z., Khamroyev, I., & Ibodov, I. (2021). The usage of a combined machine in the process of preparing the land for planting. In *E3S Web of Conferences* (Vol. 264, p. 04092). EDP Sciences.
8. Муродов, Р. А., Барнаева, М. А., Ибодов, И. Н., & Ёкубов, Т. А. (2020). Динамика объемной влажности при послойно-поэтапном рыхлении на фоне горизонтального систематического дренажа. *Экономика и социум*, (11 (78)), 933-936.
9. Ulugbekovich, M. O., Sobirovich, K. B., Komiljonovna, S. M., & Nizomiy ogli, I. I. (2020). Smart irrigation of agricultural crops. *Middle European Scientific Bulletin*, 3, 1-3.
10. Jalilovich, K. J., Xurram, N., & Nizomiy, I. I. (2021). Theoretical Approach To Determining The Demand For Land Leveling In The Bukhara Region. *International Journal of Engineering and Information Systems (IJEAIS)*, 5(2), 162-164.
11. MURADOV, O., KATTAYEV, B., & SAYLIXANOVA, M. Sprinkler Irrigation Equipment and Types of Them. *International Journal of Innovations in Engineering Research and Technology*, 7(05), 45-47.
12. Kurbanmuratovich, M. R., Jalilovich, K. J., Ugli, I. I. N., & Ugli, N. M. M. R. (2021). TO EXAMINE THE EFFECT OF LEVELING AGGREGATES ON PRODUCTIVITY IN THE LEVELING OF CROP AREAS. *Web of Scientist: International Scientific Research Journal*, 2(07), 30-35.
13. Bakhtiyorovna, I. L., & Baxodirovna, B. N. (2021). Development Of Procedures For Irrigation Of Corn Variets AS Main Crops. *Academicia Globe: Inderscience Research*, 2(04), 109-113.

14. Jalilovich, K. J., & Kurbanmuratovich, M. R. (2021). EFFECTIVENESS OF APPLICATION OF MODERN MELIORATIVE TECHNIQUES IN CLEANING OF OPEN COLLECTORS AND DRINKS. *Academicia Globe: Inderscience Research*, 2(6), 1-4.
15. Fazliev, J., Khaitova, I., Atamurodov, B., Rustamova, K., Ravshanov, U., & Sharipova, M. (2019). Efficiency of applying the water-saving irrigation technologies in irrigated farming. *Интернаука*, 21(103 часть 3), 35.
16. Фазлиев, Ж. Ш., Хайтова, И. И., Атамуродов, Б. Н., Рустамова, К. Б., & Шарипова, М. С. (2019). ТОМЧИЛАТИБ СУҒОРИШ ТЕХНОЛОГИЯСИНИ БОҒЛАРДА ЖОРИЙ ҚИЛИШНИНГ САМАРАДОРЛИГИ. *Интернаука*, (21-3), 78-79.
17. Fazliyev, Z. S., Shokhimardonova, N. S., Sobirov, F. T., Ravshanov, U. K., & Baratov, S. S. (2014). Technology of the drip irrigation use in gardens and vineyards. *The Way of Science*, 56.