Results of Experimental Studies on Determining the Parameters of Working Bodies with Minimal Processing to the Top of the Bush

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ABSTRACT

The article presents the parameters of the working bodies used in the preparation of seeds of repeated crops for sowing in exact quantities, with minimal processing of the combined aggregate to the top of the bush, that is, the number of discs of the rotational working body, the height of the blades installed on them crosswise, the steep pressure force exerted on the rotational Multi-factor experiments were carried out according to the Hartley-3 plan. The data obtained in the experiments were processed according to the PLANEXP program developed in the experimental-test section of the *(SROIMAA)* and regression equations were obtained that adequately represent the evaluation criteria. In this case, in the assessment of the uniformity of dispersion, the Cochren criterion was used, in the assessment of the value of regression coefficients, the Styudent criterion was used, and in the assessment of the adequacy of regression models, the Fisher criterion was used. The resulting regression equations were determined by the optimal values of the parameters of the soil in the zone treated by the rotational working bodies, solved together from the conditions that the level of soil motility in the treated zone is higher than 80 percent, and the traction resistance of the rotational working body is minimal.

Keywords: combined aggregate, minimum processing to push, rotation working body, number of discs of rotation working body, height of transverse set blades, steep pressure force, aggregate movement speed, soil UV resistance, traction resistance, agrotechnical demand, parameter optimization, multi-factor experiment, mathematical planning method

Introduction

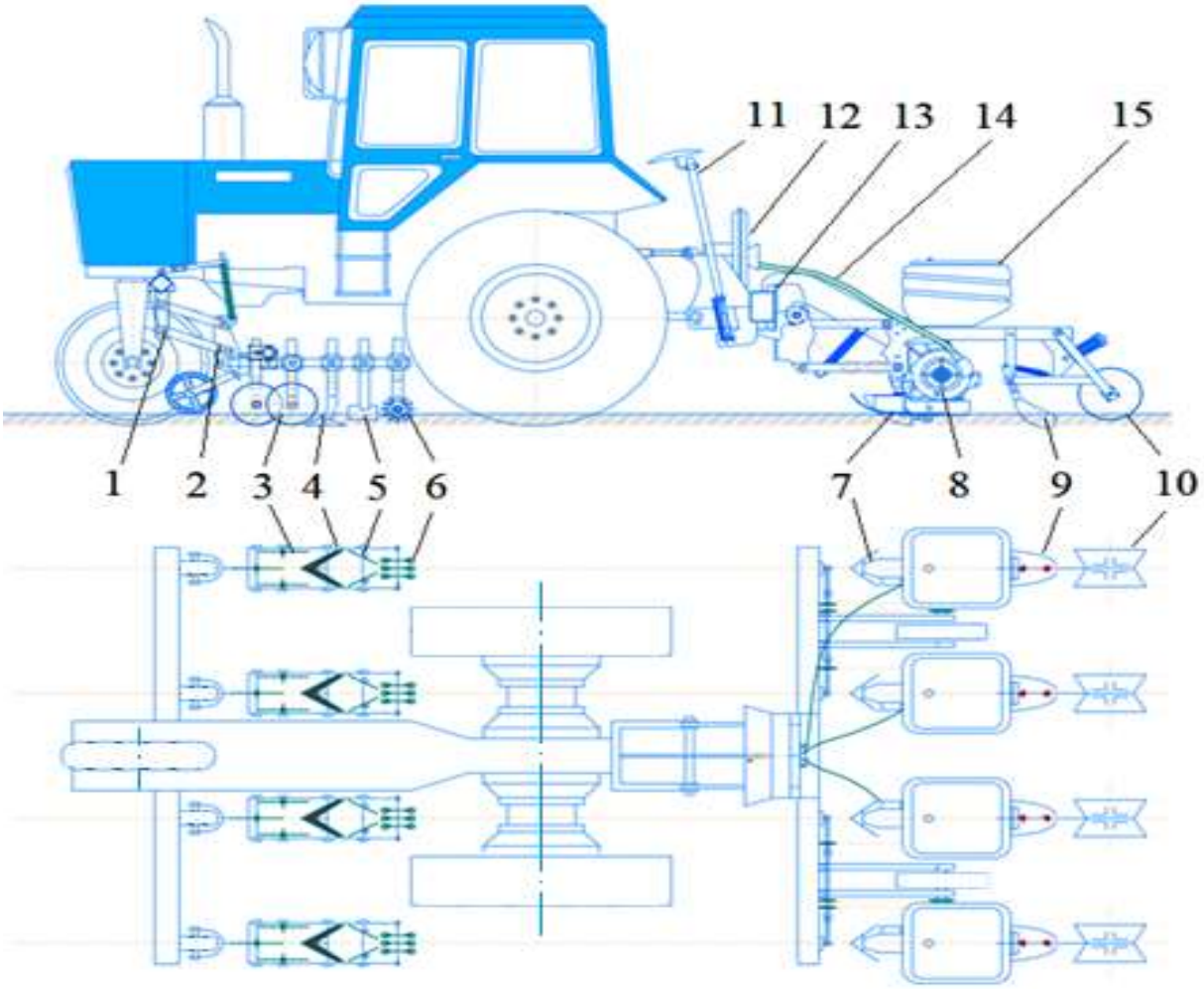
In order to ensure the high-quality sowing of seeds in the world, the leading place is occupied by the development of energy-resource-efficient, working unit and high-quality technical means used in the preparation and planting of land and increasing their performance. Modern agricultural production dictates the solution of the problems of increasing crop yields, maintaining soil fertility based on resource-efficient technologies that provide for the joint implementation of several technological processes. Of particular importance in this is the problem of sowing seeds in exact quantities along with soil treatment. "Every year around the world is 1.8 billion. taking into account the cultivation of hectares and agricultural crops" [1] the need arises for the development of combined aggregates that, in one pass of the aggregate with a high level of energy-resource, quality of work and unity in the preparation and planting of land for planting, carry out the addition of one-time minimum processing and planting

technological processes in the soil. Therefore, much attention is paid to finding a solution to such a problem.

Based on the above, a construction and experimental copy of the combined aggregate was developed, which carried out the sowing of seeds of repeated crops in exact quantities, along with minimal processing to the top of the Bush in one pass of the aggregate in the fields freed from wheat in the *(SROIMAA)* [2,3,4]..

The combined aggregate consists of two parts: a pneumatic sowing pit, which performs the sowing of seeds of repeated crops on them in exact quantities, front and rear, with minimal processing to the top of the front stem.

For minimal processing on the surface of the pusher, A Parallelogram mechanism 2 Tool is installed on the right and left Ramas placed in the front part of the tractor with a flat disc 3, a axial paw 4, a straightener 5 and a rotation softener 6. On the rear suspension mechanism of the tractor, a pneumatic planting saw for sowing seeds of repeated crops is hung. It is based on rama 13, soshnik 7 to form a groove fixed to it, a pneumatic sowing machine that provides accurate sowing of seeds 8, support-extension wheels that propel them, eksgauster 12 to form an air vacuum, and hose 14, a burying working body for burying seeds planted to a specified depth 9, and shibbalovichi katok 10, seedbunker 15 and marker 11 to compact.



1-cultivator Ram; 2-parallelogram mechanism; 3-flat disc; 4-Arrowhead;

5-leveler; 6-rotation working body; 7-soshnik; 8-pneumatic planting apparatus; 9-burying working body; 10-rustling katok; 11-marker; 12-eksgauster; 13-seyalka frame; 14-hose;

15-seedbunker

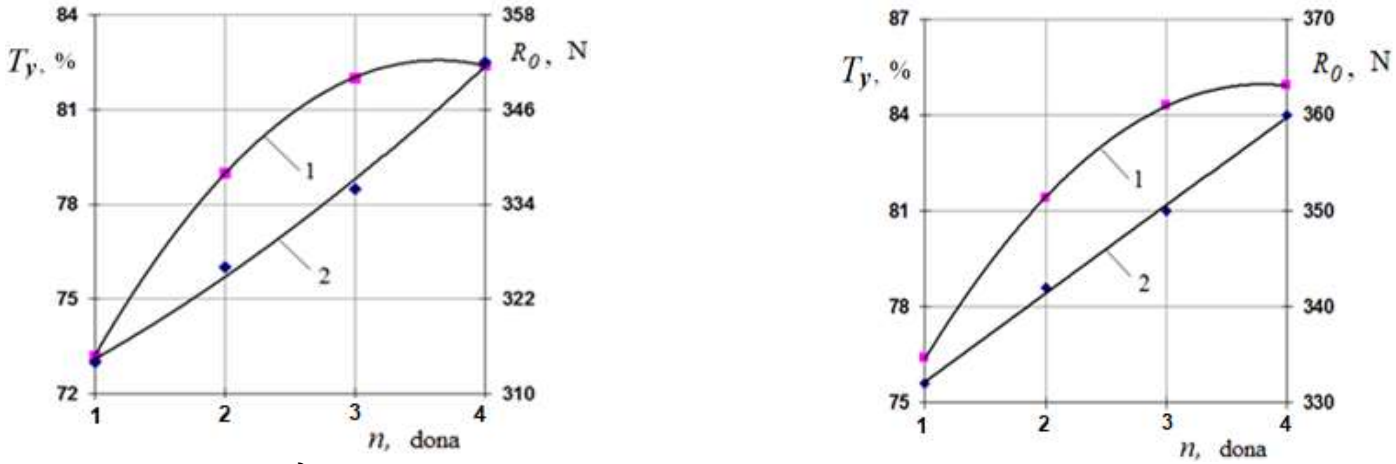
Figure 1. Constructive Scheme Of The Combined Aggregate

When sowing seeds of repeated crops in areas freed from wheat, the combined aggregate, in one pass, produces a fine soil with minimal processing on the surface of the Bush, and also sows seeds of repeated crops in exact quantities.

Despite the fact that the rotation of organs requires high-quality research with low energy consumption, it certainly provides the best quality of equipment.

Materials and research methods

To study the effect of the number of rotational work organ discs on its working performance, the number of discs was changed from 1 to 4. In this case, the height and number of blades installed on each disc were taken 6 cm and 12, respectively, the steep pressure force supplied to the rotational working body was 300 N, the speed of movement of the aggregate was 6.0 and 8.0 km/h. The results obtained in the experiments are shown in Figure 2.



а) б)

а) *V*=6,0 km/h; б) *V*=8,0 km/h.

2-RASM. Rotacion Ishchi organ disclari sonining tuprokning uvalanish darajasi (1) VA tortishga karshilik (2)ka ta'siri

From the data presented in Figure 2, it can be said that the number of discs of the rotation working body is from 1 when the aggregate movement speed is 6.0 km/h and 8.0 km/h

The level of soil ovulation increased by 3, that is, the amount of fractions smaller than 25 mm increased from 73.2 percent to 80.1 percent, respectively, and from 76.4 percent to 83.6 percent, while later this figure remained practically unchanged when the number of discs increased from 3 to 4.

This can be explained by the fact that with an increase in the number of discs of the rotational working body, the degree of their impact on the soil increases. It should be noted that when the number of discs of the rotational working body was 3 units, the quality of soil uvization was at the level of agrotechnical requirements.

The traction resistance of the rotational work body was increased by the law of the straight line from 314 N to 352 N and from 332 N to 368 N, respectively, with an increase in the number of its discs from 1 to 4 when the aggregate movement speed was 6.0 and 8.0 km/H. This can be explained by an increase in the number of discs interacting with the soil.

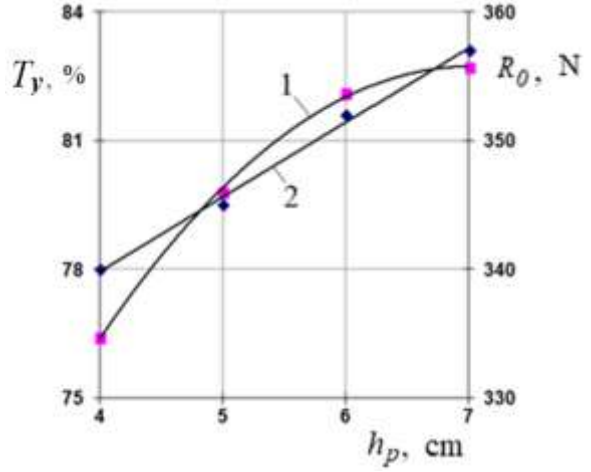
With an increase in the speed of the aggregate from 6.0 km/h to 8.0 km/h, the level of soil ovulation has improved. This can be explained by the increase in the impact force exerted by the rotational work organ on the soil fragments with an increase in the speed of movement of the aggregate.

So, according to the results of experimental studies carried out, the number of rotational work organ discs should be at least 3 pieces in order for the level of soil howl with low energy consumption to be at the level

of agrotechnical requirements poured.

Rotation of organs of disclosure elderly pichoclar highly effective unitary.

In experiments to study the effect of the height of the blades installed transversely on the discs of the rotation working body on its working performance, the height of the blades was changed from 4 cm to 7 cm. In this case, the number of discs of the rotational working body was 3, the steep pressure force supplied to it was 300 N, the number of blades installed crosswise on each disc was 12, the speed of movement of the aggregate was 6.0 and 8.0 km/h. The results obtained are shown in Figure 3.



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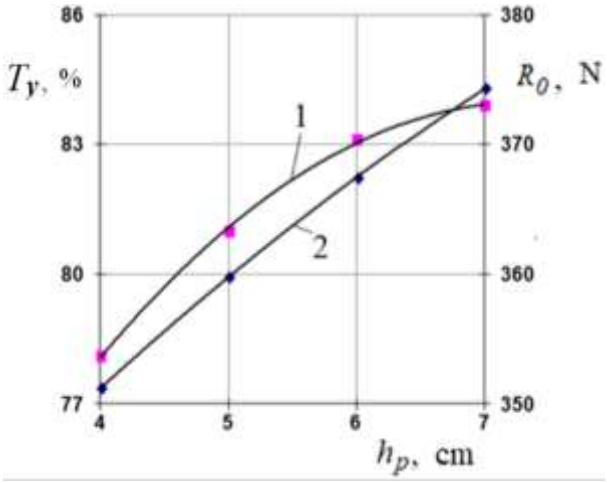


б)

а) *V*=6,0 km/h; б) *V*=8,0 km/h.

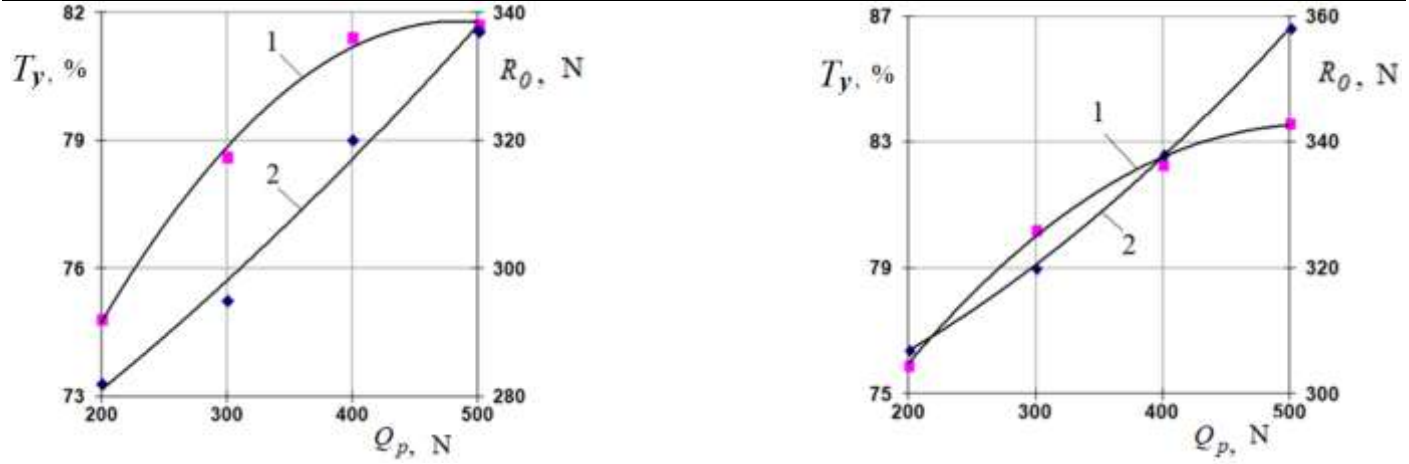
Figure 3. The height of the blades installed transversely on the discs of the rotation working body is determined by the degree of soil uvation (1) and the effect of traction resistance (2).

3-rated engine power, aggregate power of 6.0 and 8.0 km/h the speed of rotation of the drive of the drive of the disclaring unit cylindrical power 4 cm 4 cm dan 6 cm. The amount of fluid for hydraulic fracturing, i.e. 25 mm 3.4% the amount of fluid for hydraulic fracturing is 8,4,7%. the percentage of gacha and 78.1 percent 83.9 percent ortgan. Keynsik bu kursatkich senior student pikliggar 6cm Dan 7cm hashish bilan dezhavrl carpet production. Yana noted the need, rotation and disclosure authority elder pichoklar sublime 5 cm kttttha bumporting improving the quality of agrotechnical breeding.

The traction resistance, on the other hand, increased from 340 N to 357 N and from 351 N to 374 N, respectively, according to the law of the straight line, with transverse-mounted blades on the discs of the rotational working body at speeds of 6.0 and 8.0 km/h of the aggregate with an increase in height from 4 cm to 7 cm. This can be explained by the fact that an increase in the height of the blades installed crosswise on the discs of the rotation working body leads to an increase in the depth of soil processing.

According to the results of the experimental studies carried out, in order for the quality of soil ovulation with low energy consumption to be at the level of agrotechnical requirements poured, the height of the blades installed transversely on the discs of the rotational working body should be at least 5 cm.

Effect of the steep pressure force exerted on the rotation working body on its working performance. Based on the results of theoretical studies, the steep pressure force exerted on the rotational work body in experiments was changed from 200 N to 500 N with an interval of 100 N. In this case, the number of rotational work organ discs was 3, the height and number of blades installed crosswise on each disc were taken 6 cm and 12 pieces, respectively, the speed of movement of the aggregate was 6.0 and 8.0 km/h. The results obtained are shown in Figure 4..



а) б)

а) *V*=6,0 km/h; б) *V*=8,0 km/h.

Figure 4. The effect of steep pressure force exerted on the rotation working body on the soil uvation level (1) and traction resistance (2)ka

From the data presented in Figure 4, it can be said that the level of soil ovulation increased from 74.8 percent to 81.7 percent and from 75.9 percent to 83.6 percent, respectively, when the steep pressure force supplied to the rotational working body at speeds of 6.0 and 8.0 km/h was increased from 200 N to 400 N. With an increase in the steep compressive strength from 400 N to 500 N, which is then given to the rotational working body, the level of soil motility remains practically unchanged. The main reason for this rotation work is that with an increase in the steep pressure force exerted on the organ, the effect exerted by the rotational work organ on the soil of the PUST upper part at the beginning was given to the zone softened by the flat disc and the axillary paw, and later reached the non-softened zone, resulting in In addition, the steep pressure force exerted on the rotational working body affects the depth of its immersion in the soil and, consequently, the degree of its ovulation.

And the traction resistance increased intensively from 282 N to 337 N and from 307 N to 358 N, respectively, with an increase in the steep pressure force exerted on the rotational work Organ at speeds of 6.0 and 8.0 km/h of the aggregate from 200 N to 500 N.

Rotation work with an increase in the steep pressure force exerted on the organ, the increase in the level of soil motility and resistance to gravity occurs mainly due to changes in the pressures and voltages generated by it in the soil.

According to the results of the experimental studies carried out, in order for the quality of soil ovulation with low energy consumption to be at the level of agrotechnical requirements poured, the steep pressure force supplied to the rotational work body must be at least 350 N.

Optimization of the parameters of the rotation softener. Based on the results of theoretical studies and one-factor experiments, the optimal values of the rotation softener were determined using the method of mathematical planning of multi-factor experiments [5,6].

When conducting multi-factor experiments, the level of soil motility and the traction resistance of the working body were adopted as the evaluation criterion. The experiments were carried out using a table of random numbers, and the data obtained were processed according to the "regression analysis" program developed in the experimental-testing Department of *(SROIMAA)* [7,8]. In this case, in the assessment of the uniformity of dispersion, the Cochren criterion was used, in the assessment of the value of regression coefficients, the Styudent criterion was used, and in the assessment of the adequacy of regression models, the Fisher criterion was used.

Table 1 lists the factors affecting the evaluation criteria, their conditional designation, variation intervals and levels.

Table 1

Factors, their conditional designation, variation range and levels

Factors and their designation	Unit of measurement	Factors				
		coded icon	change range	Surfaces		
				Low (-1)	main (0)	high (+1)
1. Number of rotation working body discs	pieces	X_1	1	2	3	4
2. Steep pressure force supplied to the rotation working body	N	X_3	100	300	400	500
3. The speed of movement of the aggregate	km/h	X_4	1	6,0	7,0	8,0

By processing the results of the experiment in the order indicated, the following regressive equations were obtained that adequately describe the evaluation criteria:

- by the degree of soil motility (%)

$$Y_1 = 79{,}796 + 1{,}750\,X_1 + 1{,}950\,X_2 + 1{,}470\,X_3 + 1{,}910\,X_1X_2 - 1{,}738\,X_1X_3 - 0{,}829\,X_2^2 - 1{,}438\,X_2X_3 + 1{,}278\,X_3^2 \quad (1)$$

- on the traction resistance of the rotational work body (N)

$$Y_2 = 350{,}246 + 7{,}000\,X_1 + 19{,}000\,X_2 + 17{,}833\,X_3 - 4{,}225\,X_1^2 + 6{,}750\,X_1X_3 + 3{,}775\,X_2^2 - 6{,}750\,X_2X_3 + 7{,}109\,X_3^2 \quad (2)$$

As can be seen from the analysis of the resulting regression equations, all factors had a significant impact on the evaluation criteria.

(1) and (2) regression equations "Y1" criterion, that is, the amount of soil fractions smaller than 25 mm in size in the treated layer should not be less than 80 percent, while the criterion "Y2" is solved from the condition that it has a minimum value, In the range of work speeds of 6.0-8.0 km/h, the following values of factors were determined that ensure the fulfillment of these conditions (Table 2):2-жадвал

Optimal values of the parameters of the rotational working body

V (X_3)		n (X_1)		Q_p (X_2)	
coded icon	Natural, m/s	coded icon	Natural, pieces	coded icon	Natural, N
-1	6	0,7823	5,7823	-0,3857	361,42
0	7	0,3874	5,3874	0,5874	458,74
1	8	-0,5885	4,4114	-0,8452	315,48

So, in order for the rotation working body to ensure that the push top part is processed at the required level at work speeds of 6.0-8.0 km/h, the number of its discs should be 3-4 pieces, and the steep pressure force exerted on it should be in the range of 315.48-458.74 N. At these values, the level of soil motility and the tensile resistance of the working body were 80.33-82.46 N and 338.32-365.92 N, respectively.

Conclusion

According to the results of the experiments carried out, in order to ensure reliable execution of the technological process at a speed of 6-8 km/h of movement of the rotational working body, as well as high quality of work with low energy consumption, the number of its discs should be 3 pieces, the height of the blades installed transversely on the discs should be At these values, the level of soil motility and the tensile resistance of the working body are 80.33-82.46% and 350-400 N, respectively.

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