RESULTS OF RESEARCH ON THE BASIS OF PARAMETERS OF THE CYLINDER LEVELER WITH ROLLER

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DOI: 10.5958/2249-7137.2022.00267.1

ABSTRACT

This article presents the results of multi-factor experiments conducted under the Hartley-4 plan to determine the optimal values of the wheel roller leveler-alignment parameters. At a rate of 6.0-9.0 km/h, the diameter of its gallbladder is 29.6-35.0 inches [29.6-35.0 sm] in diameter to ensure the quality of work at the required level of energy, It has been determined that the installation load given to it should be between 2.00-2.51 kN/m, the steep distance between the roller leveler-aligner's alignment and gallbladder is 3.16-3.26 cm.

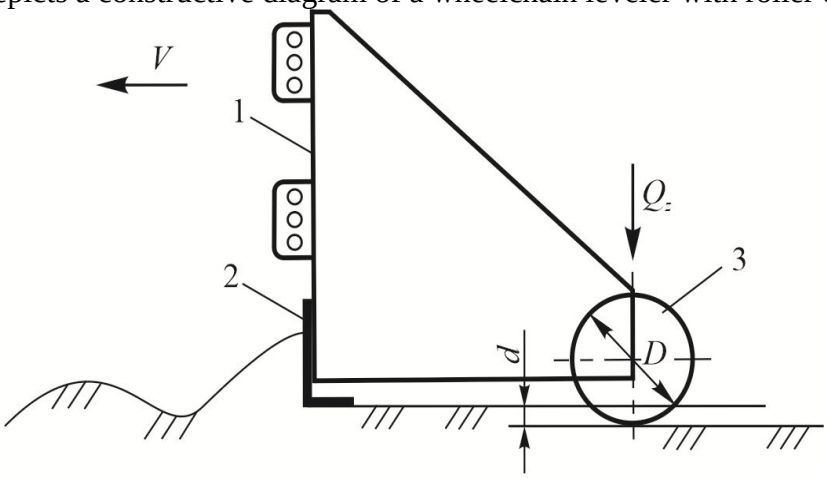
KEYWORDS: *Leveler With Roller, Equalizer, Rink, Diameter Of The Rink, Comparative Tick Load Given To The Rink, The Sewing Distance Between The Leveler With Roller, The Speed Of Movement, The Level Of Soil Rotation, The Density Of The Soil, The Comparative Resistance To Gravity.*

INTRODUCTION

It is known that the main task in preparing the land for planting is to level the surface of the fields, densify them at the required level, and crush large cuts in it, forming a thin layer of soil. Currently, MV-6.0, MV-6.5 and other roller-flatters are widely used in Uzbekistan for this purpose. But existing leveler with rollers are uncomfortable to use because of the tyre, have low maneuverability and work performance, require a large rotation area (and that is, a lot of time spent on salt walking). Additionally, because dense parts of existing leveler with rollers are affected by soil, they are accompanied by a combination of soil and sticking soil and plant residues to their working surfaces. The resulting rise in nutrients and then inserted into her womb, where it implanted.

Our research has shown that the highlighted deficiencies of existing leveler with rollers can be overcome by replacing the denser part of the soil with a rotating wheel, which has a working surface. The resulting rise in sea levels from the meltdown, the meltdown, which finally left him paralyzed. As a result of these highlights, our institute is conducting scientific research on the development and parameters of a hemp leveler with roller (hereinafter referred to as a cylinder) made up of cylinders [**1, 2].**

Figure 1 depicts a constructive diagram of a wheelchain leveler with roller developed.



Frame equipped with a hanging device 1; 2nd leveling working part; 3-roller

Figure 1. Constructive diagram of the cylinder roller-aligner

It consists of a frame 1, a leveling work piece (hereinafter referred to as a leveling) 2 and a roller 3 equipped with a roller breaker-leveling hoist, which flattens the processed field surface when the roller 2 moves across the field, roller 3 rotates around its axis and compacts the flattened surface.

This article presents the results of experiments conducted to determine the values of the diameter *D* of the roller, the specific vertical load *Qz*, the vertical distance *d* between the straightener and the roller (see figure), which provides the required level of work quality with low energy consumption.

Materials and research methods

To solve the issue, multi-factor experiments were conducted on the Hartley-4 plan **[3, 4].**

The following table presents factors, their marking, units of measurement, and the levels of change.

TABLE 1 INTERMEDIATE AND LEVELS OF CHANGE OF FACTORS

Factors	Factors									
	markings		units of measurement		Levels					
					bottom		main		Top	
	natural	encoded	natural	encoded	natural	encoded	natural	encoded	natural	encoded
1. Diameter of the cylinder	*D*	X_1	sm	−	25	-1	30	0	35	+1
2. Comparative tick load given to the cylinder	Q_z	X_2	kN/m	−	2,0	-1	2,5	0	3,0	+1
3. The sewing distance between the alignment and the cylinder of the cylinder	*d*	X_3	sm	−	3	-1	4	0	5	+1
4. Speed of action	*V*	X_4	km/h	−	6,0	-1	7,5	0	9,0	+1

Note: − -measurement means that it is undiglied.

As an evaluation criterion for conducting multi-factor experiments the level of fertilization of the soil in a layer of 0-10 cm, that is the amount of soil fractions smaller than 25 mm in size, the density of the soil in a layer of 5 to 15 cm, and the gloomy roller with leveler were obtained, that is the resistance of the cylinder to the width of a meter of cylinders.

An open box with sides of 0.5x0.5 m was used to determine the quality of the soil of the field, which was processed by a roller with leveler, and at six recurrences (In the direction of movement of the aggregate, samples were taken from 0-10 cm layers forward and back) and passed through the elbows, which were 50 and 25 mm in diameter of their holes. Soil fragments (fractions) that remained in the elbows and passed through the last elbow were weighed on the RP-100Sh-13 scales, and the amount of fractions larger than 50 mm, smaller than 50-25 mm and 25 mm was determined in percentage compared to the total mass. At the same time, fractions smaller than 25 mm were accepted as the level of soil fertilization.

The density of the soil was determined using a cylinder with a density of 502 cm^3 and a height of 10 cm **[5].**

The general gravity resistance of the cylinder roller-aligner was determined by dividing the total resistance to gravity into the width of the cylinder **[6].**

The sequence of experiments was adjusted using a table of random numbers to reduce the physical and mechanical properties of the soil and the impact of irregularity on the field surface on the criteria for evaluating variability **[7].**

The information obtained in the experiments was processed according to the "PLANEXP" program developed in the institute's experimental department **[3].** In this case, the Cochren criterion was used to evaluate the uniformity of the dispersion, the Styudent criterion for evaluating the value of regression coefficients, and the Fisher criterion to evaluate the adequacy

of regression models **[8-9].**

Study findings and their discussion

The following regression equations were obtained, which adequately represent the evaluation criteria for encoded markups, in the order specified in the results of the experiment:

– by the level of soil abscess (%)

$Y_1=87,207-1,298X_1+2,320X_2+1,750X_3+0,769X_4+$

$+0,903X_1X_1-0,590X_2X_4-1,186X_3X_3-0,402X_3X_4-0,355X_4X_4;$ (1)

– by the density of the soil in a layer of 5-15 cm (g/cm^3)

$Y_2=1,169-0,055X_1+0,050X_2+0,048X_3-0,040X_4+0,047X_1X_1-$

$-0,015X_1X_2-0,015X_1X_3-0,028X_2X_2+0,042X_2X_3-0,015X_2X_4-$

$-0,027X_3X_3-0,012X_3X_4+0,022X_4X_4$; (2)

– by the comparative resistance of the cylinder to the cylinder (kN/m)

$Y_3=1,429-0,066X_1+0,168X_2+0,120X_3+0,030X_4+0,009X_1X_1+$

$+0,011X_1X_2+0,009X_1X_3-0,010X_1X_4+0,014X_2X_2+0,018X_2X_3-$

$-0,018X_2X_4--0,051X_3X_3-0,012X_3X_4+0,005X_4X_4.$ (3)

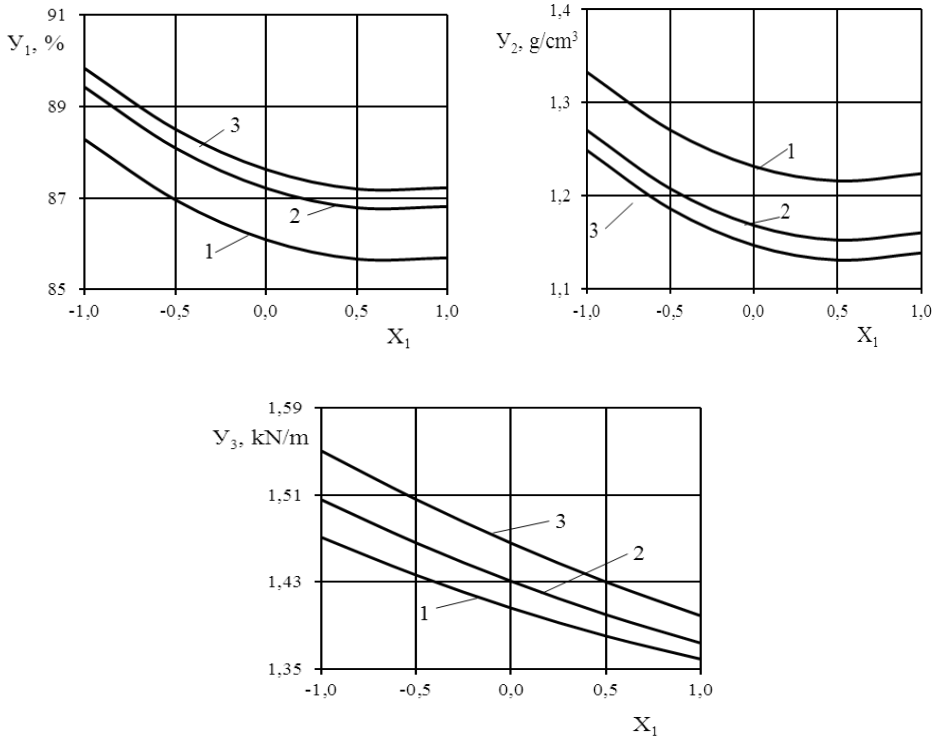
in this $X_1=(D-30)/5$; $X_2=(Q_z-2,5)/1,5$; $X_3=4$; $X_4=(V-7,5)/1,5$

Analysis of (1)-(3) regression equations and graphical connections built on them (Figures 2-4) shows that all factors had a significant impact on the evaluation criteria.

With an increase in the diameter of the cylinder, that is the X_1 factor increases, the Y_1 and Y_2 criterion, that is the level and density of the soil, decreased before and then remained unchanged, the Y_3 criterion, that is, resistance to weighing, decreased almost by the law of the straight line.

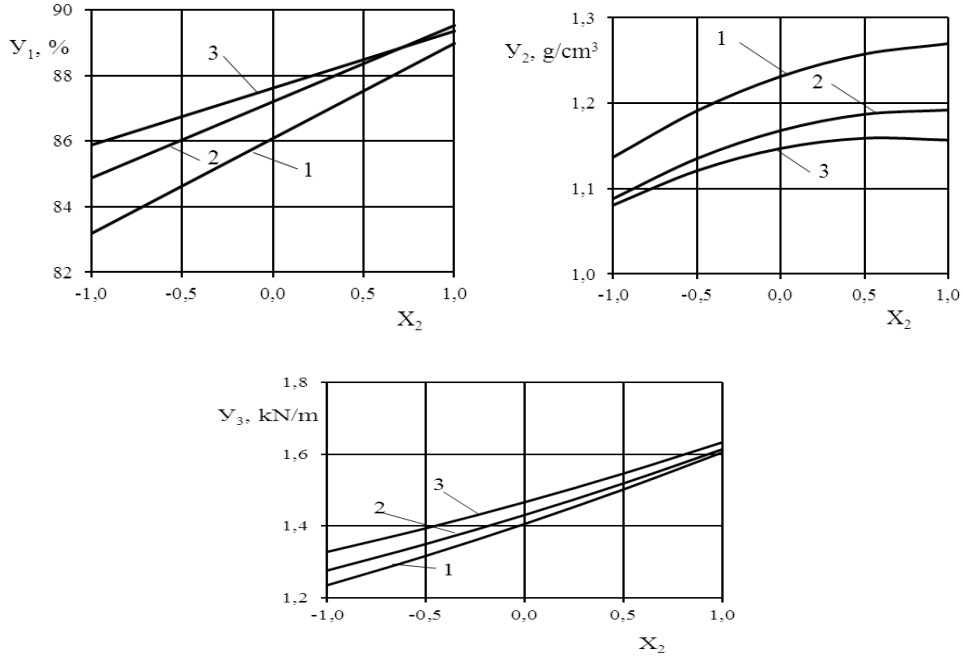
As the comparative tick load on the X_2 factor, or roller-aligner, increased, the Y_1 and Y_3 criteria increased almost straight lines, and the Y_2 criterion increased according to the law of the parabola.

As the X_3 factor increased, all criteria increased according to the law of the parabola.



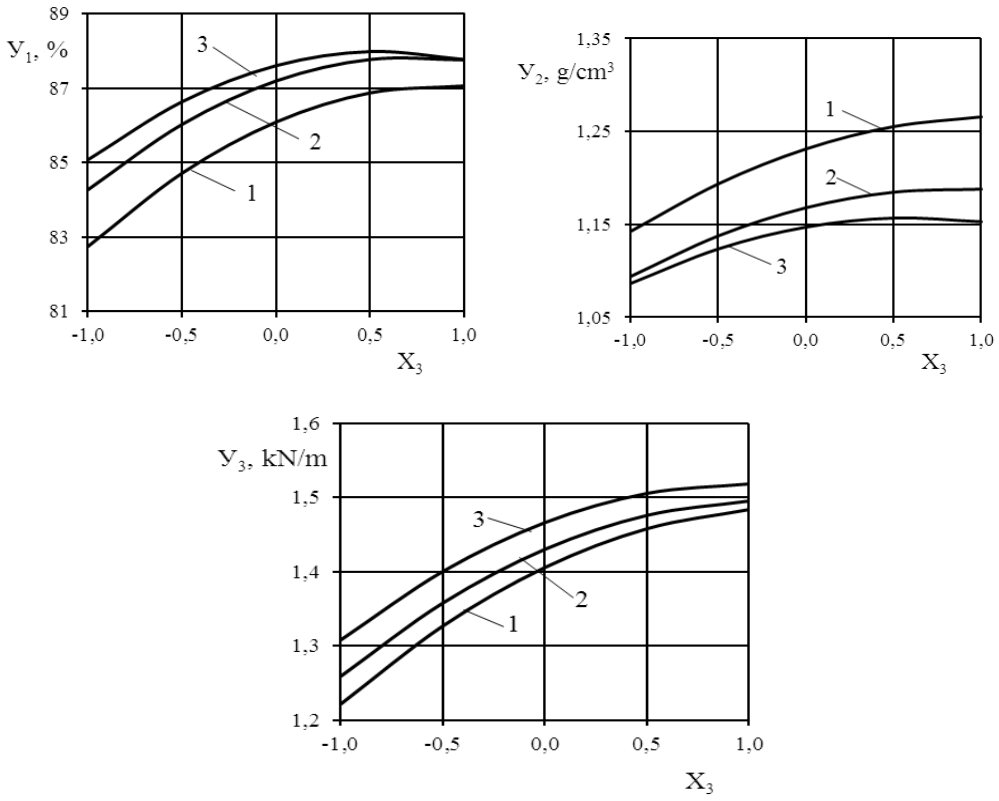
When the speed of movement is 6.0, 7.5 and 9.0 km/h, respectively, 1.2 and 3

Figure 2. The criteria Y_1 , Y_2, Y_3 depend on the factor X_1 change graphics



When the speed of movement is 6.0, 7.5 and 9.0 km/h, respectively, 1.2 and 3

Figure 3. The criteria Y_1 , Y_2 and Y_3 depend on the factor X_2 change graphics



When the speed of movement is 6.0, 7.5 and 9.0 km/h, respectively, 1, 2 and 3

Figure 4. The criteria Y_1 , Y_2 and Y_3 depend on the X_3 factor change graphics

(1)-(3) regression equations Y_1 criterion is more than 80%, The Y_2 criterion is between 1.1-1.2 g/cm3 and the diameter of the level roller with leveler-alignment , developed at a speed of 6.0-9.0 km/h, is between 29.6-35.0 cm, It was determined that the steep load given to him should be between 2.00 and 2.51 kN/m, and the sewing distance between the roller with leveler and the roller should be between 3.16 and 3.26 cm.

At these defined values of factors, the criteria Y_1, Y_2 and Y_3 are 80,12-86,11%, 1,10-1,13 g/sm^3 and 1,03-1.36 kN/m, respectively.

Therefore, the developed roller with leveler-aligner is 29.6-35.0 cm in diameter to ensure the quality of work at the required level, with low energy consumption at 6.0-9.0 km/h, The sewing load given to it should be between 2.00-2.51 kN/m, the steep distance between the roller-aligner's alignment and leveler is 3.16-3.26 cm.

CONCLUSION

According to the results of multi-factor experiments, the diameter of its roller with leveler is 29.6-35.0 cm to ensure the quality of work at low energy speeds of 6.0-9.0 km/h, The steep load given to it should be between 2.00-2.51 kN/m, the steep distance between the roller-aligner's alignment and leveler at 3.16-3.26 cm. The earth's tilt, rotation, and orbit are all just right to prevent the point of no more than the fence or boiling through by deep ravines. **[10]**

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