

Results of Acceptance Tests of the Double-Deck Disc Plough

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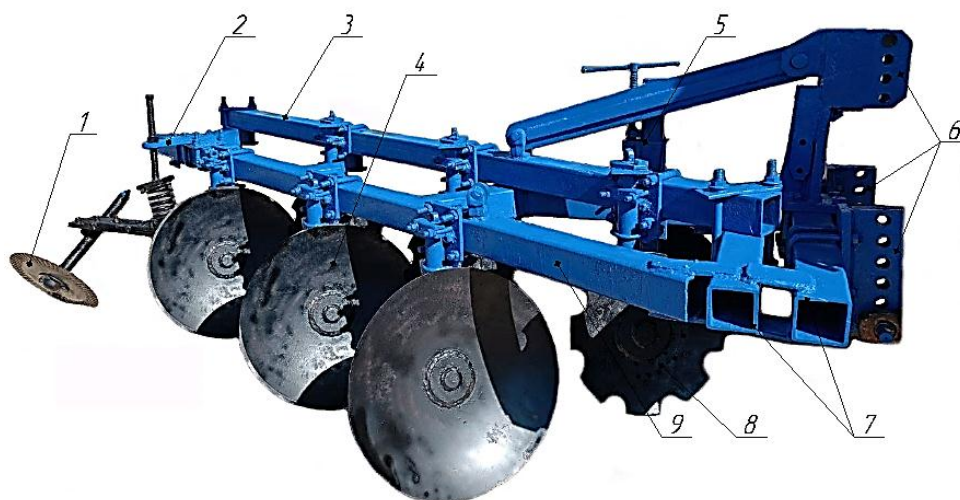
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Abstract: The article gives the results of acceptance tests of the industrial copy of the disc plough developed for tractors of 2,0-3,0 classes. According to the data obtained, the performance of the double-deck disc plough fully meets the requirements for it.

Keywords: support wheel, rear support device, longitudinal bar, suspension device, longitudinal bars, and frame.

Introduction. In recent years, disc ploughs, i.e. disc ploughs with spherical disc-shaped working bodies, have been widely used all over the world for ploughing instead of tipped ploughs. Since the working bodies not only move forward, but also rotate, disc ploughs have less resistance to traction than tilt ploughs, working without clogging with weeds and plant residues. In addition, disc ploughs are simple in construction in comparison with turnover ploughs do not require special maintenance, because the ploughs for shimming has less wear and constantly ploughshlage self-sharpening (due to the rotating work), as well as because of the length (compared to Lemekhov) discs last several times longer.

Proceeding from the above, on the basis of researches carried out in our institute, together with JSC "BMKB-Agromash" an experimental copy of disc plough was made and acceptance tests were carried out in "Accredited agrotechnical testing centre" at it.



1 - support wheel; 2 - rear support device; 3 - longitudinal bar; 4 - Lower main disc casing; 5 - support wheel adjustment mechanism; 6 - suspension device; 7 - longitudinal bars; 8 - upper disc casing; 9-frame.

Figure 1: General view of a double-deck disc plough



The base disc, on the other hand, ensures that the plough moves straight in a horizontal plane, i.e. it acts like a field board.

During operation, the support wheel rests on the field surface and the base disc rests on the bottom of the saddle left by the last implement.

Can be used depending on the class of tractor used, ploughing depth and physical and mechanical properties of the soil.

Experimental tests were carried out on the field of experimental farm of the Research Institute of Agricultural Mechanisation Engineers. Table 1 shows the technical description of the disc plough.

Before the tests, soil moisture and hardness in layers 0-10, 10-20 and 20-30 cm, irrigated depth, mass of plant residues and weeds were determined. These values were 14.3; 16.3; and 17.2%, 1.42; 1.87 and 2.86 MPa, 9.4 cm and 0.78 kg/m² respectively.

Tests are aggregated with a New Holland 60-70 class 2.0-3.0 Tractor Ozdst 3355:2018 "Tests of agricultural machinery. Machines and implements for deep tillage. Test programme and methods" [1].

Table 1. Technical description of the double deck disc plough

No	Indicator name	Unit of measurement	Indicator value
1	Type	-	hinged
2	Class of tractor to be coupled	-	2,0-3,0
3	Operating speed	km/h	6-8
4	Number of enclosures	pieces	6
	upper hulls		3
	lower housings		3
5	Working width:	see.	30
	hulls plough		90
6	Ploughing depth	see.	Up to 30
7	Weight	kg	780
8	Estimated capacity	ha/hour	0,54-0,81

RD UZ 63.03-98 "Spain Agricultural Machinery. Method of calculation of economic efficiency of exhaustible agricultural machinery" [2] showed that the use of a double-disc plough leads to a reduction in labour and material costs for ploughing of land by 1.0-1.1 times. The data obtained during the tests are given in Table 2.

Table 2. Performance of the double deck disc plough

T/r	Name of indicators	Value of indicators		
		According to the preliminary requirements	Based on the test results	
1.	Travelling speed, km/h	6-8	6,34	7,58
2.	Working depth, cm:	Up to 30 Up to 30 no data <10 ±2	30,0 28,3 1,9 7,32	30,0 27,8 2,2 7,81
	- according to plan			
	-post facto			
	M_{cp}			
	$\pm\sigma$			
$V, \%$				



	- actual depth deviation		-1,8	-1,6
3.	Working width cm: M_{cp} $\pm\sigma$ $V, \%$	90±5 no data <10	94,2 1,87 4,44	93,4 1,93 3,93
4.	Number of fractions of the following sizes (mm) , %: >100 100-50 <50	no data no data >80	6,0 5,6 88,4	3,7 5,0 91,3
5.	Completeness of plant residues and weeds burial, %	>90	95,7	96,3
6.	Depth of incorporation of weeds and crop residues cm: M_{cp} $\pm\sigma$	>10 no data	15,6 1,86	16,4 1,93
7.	Height of irregularities, cm: - dew	>10	8,3	7,4

Conclusions.

1. At driving speeds of 6.34-7.58 km/h the performance characteristics of the disc plough fully meet the requirements placed on it.
2. The use of disc plough led to a 1.0-1.1-fold reduction in labour and material costs for ploughing.

Literature used

1. O'zDSt 3355:2018 "Qishloq xo'jaligi texnikasini sinash. Tuproqqa chuqur ishlov beruvchi mashinalar va qurollar. Sinov dasturi va usullari" // Rasmiy nashr. – Toshkent, 2018. – 32 b.
2. RD Uz 63.03-98 "Testing of agricultural machinery. Methods of calculation of economic efficiency of tested agricultural machinery". - Tashkent, 1998. - 11 c.