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RESULTS OF THE FLAT PLOW EXPERIMENT

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Abstract
The quality of soil cultivation with traditional plows does not meet agrotechnical requirements. The goal of the research is to develop a plow for smooth, furrowless plowing. A plow for smooth plowing is proposed, which contains double screw bodies, pushers of the first row, rear screw right- and left-turning plow bodies, pushers of the second row. An experimental model of a plow for smooth plowing was manufactured. The results of field tests of the developed plow are presented. It has been established that the quality indicators of the plow fully comply with agrotechnical requirements. At the same time, the degree of reduction in fuel consumption compared to the existing plow is 21.26%.

Keywords: technology, traditional plowing, layer, plow, open furrow, smooth furrowless plowing, body, double body.

Introduction
It is known that there are plowing and flat plowing technology [1-3]. Traditional plows are adapted to the Paykal method, in which "collective" and "separate" plowing is performed alternately (Fig. 1) [1-3]. The main feature of plowing with traditional plows using the Paykal method is the formation of open fields and swamps in the plowed area.
Figure 1. Basic plowing technologies [5] According to the results of research by scientists, ridges 120-150 cm wide, 28-30 cm high and open ridges 120-210 cm wide and deep are visible on the surface of the arable land. are formed with a length of 30-36 cm [4-7]. The number of open edges and curbs, additional passages and additional area during planning depends on the surface of the field, and these indicators increase with increasing surface (Fig. 2) [7].

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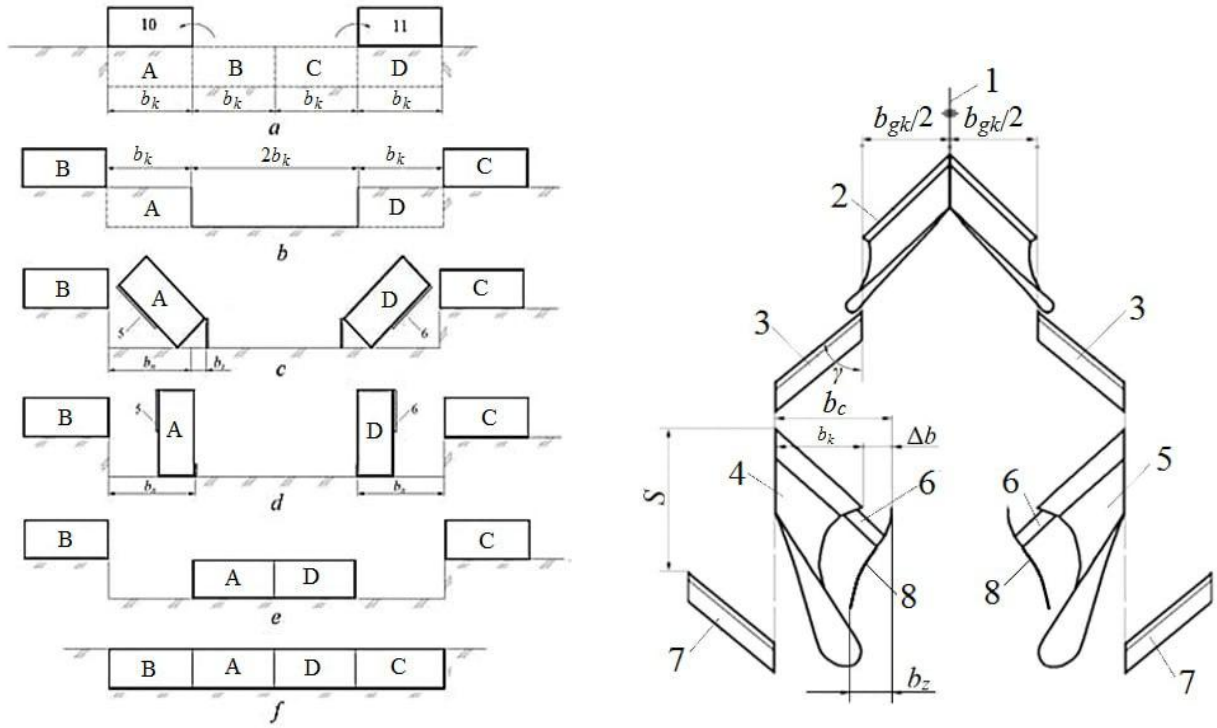
The arable layer in wastelands and marzes is very different from the arable layer on flat arable land and has a significant impact on the development of plants and, accordingly, productivity, since in areas of wasteland and wasteland the seeds are planted unevenly, as a result their germination and development will not be good.



1 **2**

Fig.1. Scheme of smooth plowing technology under closed and semi-open cutting conditions

1 – disk knife; 2 – double body; 3 – front pushers; 4 and 5 – right- and left-hand turning bodies; 6 – additional plowshare; 7 – rear pushers; 8 – guide

Fig.2. Plow diagram for smooth, furrowless plowing in closed and semi-open cutting conditions

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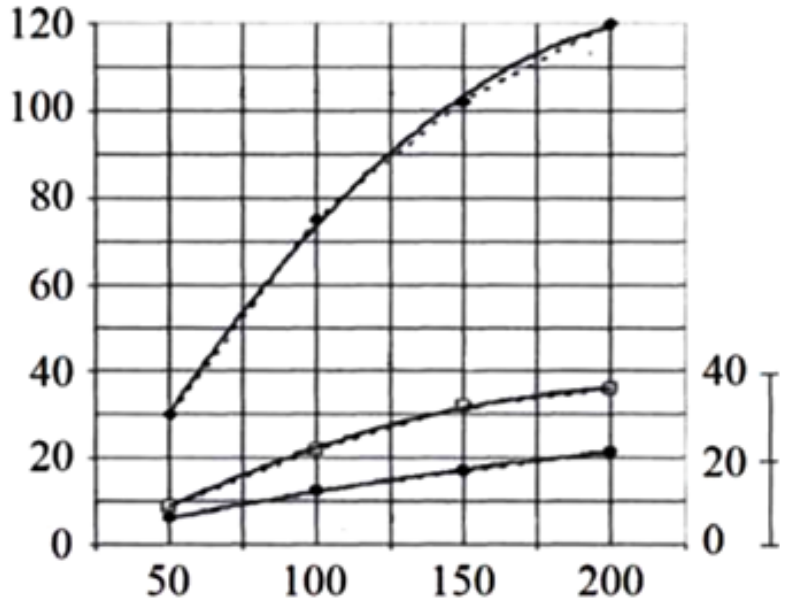

Figure 2. Dependence of the number of open edges and borders, additional passages and additional area when planning on the field surface

Irregularities formed on the surface of the plow, that is, open edges and edges, worsen the operating conditions of the units, increase the traction resistance of the machines, make harvesting difficult, and do not allow the use of the units at high speed. The resulting ditches lead to the development of water erosion on the slopes.

As can be seen from the above data, the wheat yield in an open field area 3 m wide is reduced by 30-40%. The total area of open fields and marzes that have a negative impact ranges from 6.5% to 19.5% of the total field area [8-10]. Additional operations to level the plow surface increase the cost of production, lengthen the time to prepare the field for planting, lead to rapid drying of the soil and additional water consumption.Thus, the agrotechnical, technical, economic and environmental indicators of traditional plows used in basic soil cultivation do not meet the requirements of the present time [8-10]. The purpose of the research is to develop a flat plow without a rib.

Style and materials

Field tests of plowing without a plow were carried out on the fields of the Khudaiberdiev Komil Temirovich state farm in the Karshi district of the Kashkadarya region. During the tests, the parameters of a flat plow without an edge were compared with the parameters of a standard PLN-5-35 plow. Table 1 shows data on the moisture and hardness of the field soil under study.

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A flat plow designed for closed and semi-open cutting conditions was used in conjunction with a New Holland T-7060 tractor. The working depth is 25 cm and the working speed is 8 km/h. During these tests, the following parameters of the forks were determined: coverage width; processing depth; completeness and depth of burial of plant residues; the height of unevenness on the surface of the plow; soil quality.

The indicated indicators are TSt 63.04:2001 “Testing of agricultural machinery. Machines and tools for surface tillage of soil” and TSt 63.02:2001 “Testing of agricultural machinery. The machine and tool for deep tillage were determined by the soil. The data obtained as a result of the tests were processed by the method of mathematical statistics.

Table 1 Moisture and hardness of the field soil on which the tests were carried out

Test layer, cm	Soil moisture, %	Soil hardness, MPa
0-10	8,7	2,88
10-20	10,2	3,87
20-30	12,1	4,66
30-40	13,2	4,69
0-40	11,9	4,01

Plant remains burial coverage plugs depth width in accordance with the plowman vertical cut, plow on the surface of the plant remains above the location to the limit was the distance measure path with was determined. Har one in the transition period from two vertical section made. Dimensions (0.5 cm accuracy and four times was carried out. From the soil to fall the quality of six to a point is determined (from the totality of walking in accordance with three, returning in accordance with three). From the soil to fall the quality determination for 0.25 m 2 _ on the surface of the earth the size of the sample is 0.5x0.5 m bottomless box using the obtained _ The obtained samples are from 100 mm large, from 100-50 mm and 50 mm. small in size fractions are divided. Dimensions (0.5 cm accuracy and four times was carried out. From the soil to fall the quality of six to a point is determined (from the totality of walking in accordance with three, returning in accordance with three). From the soil to fall the quality determination for 0.25 m 2 _ on the surface of the earth the size of the sample is 0.5x0.5 m bottomless box using the obtained _ The obtained samples are from 100 mm large, from 100-50 mm and 50 mm. small in size fractions are divided.

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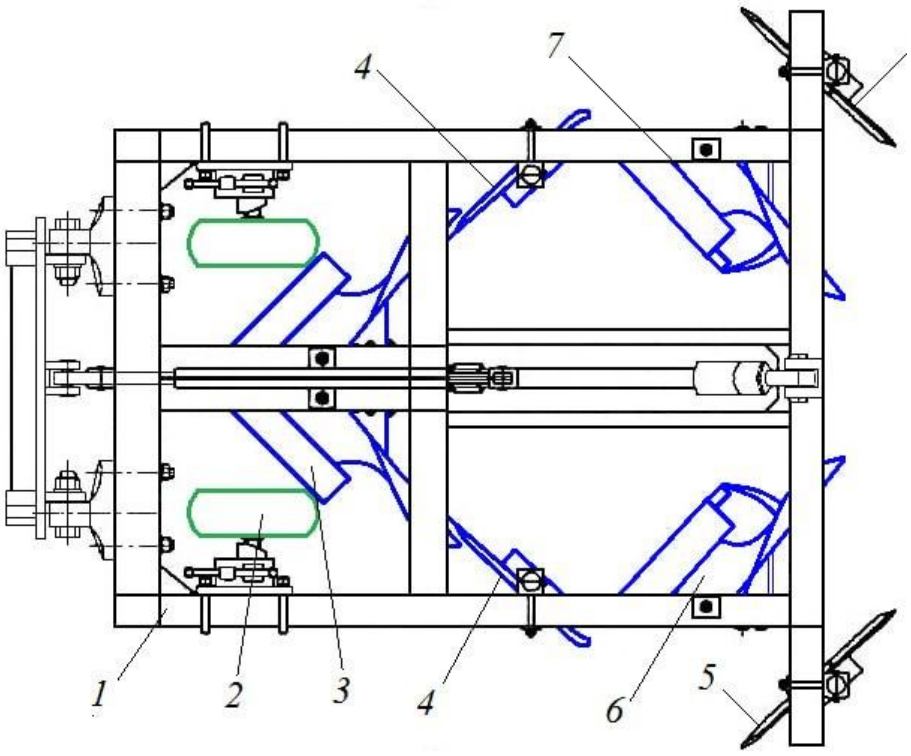
The resulting samples are shown in fractions of a separate field in a sieve with holes of 100 and 50 mm with the made rose _ In this first, according to the hand with large cuts to pick up, then the earth was separated from the sieves. All fractions on a scale with an accuracy of ±10 g were pulled out and their resulting earth sample total to mass ratio was calculated as a percentage.

Findings and debate

Before the scientific research is done, foreign countries develop flat plowing technology and fork design analysis [1; 3] and plow to be placed agricultural technology requirements to come from Russia _ RU No. 207103 of the Federation useful to the model with a patent obtained protected closed and half open cutting conditions flat make a plow _ released [1; 3]. This plug makes the technology itself a special feature From this it consists of fields closed and half open cutting conditions you do not have a flat plow made increases (Fig. 3).



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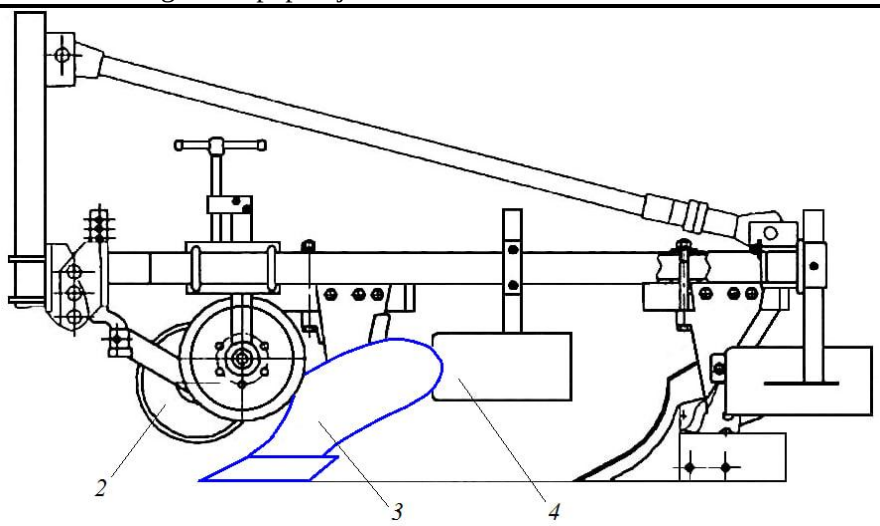

Figure 3. You don't have it flat plowing plug-in Scheme:
1 – disc-shaped knife; 2 – double-hull; 3 – previous thrusters; 4 and 5 – right and left _ body tipping; 6 – addition ploughshare; 7 – back pusher; 8 – router.

Flat processing while the fork works _ Disc-shaped knife 1 vertical on the plain soil cuts _ Double bodies have 2 blades (Fig. 3). the lower one is separated from the wall, waits and the appropriate edge processing is not given Palaksas The top is turned over. Double hulls from 2 after installed thrusters 3 blades sideways, without capsizing Palakhsani Br in width equal to the distance pushes_ Then spiral Right and Left overturning the housing 4 and 5 screw guide with plates 8 together Palakshas first cuts, bz to the side _ pushing the vertical state, that is, by 900 it turns over. From him after the body and routers under the influence of the double body the harvest made the owners fall _ From him after the engines of 7 fields on the surface of the palakhsa pushing bodies 4 and 5 give a way out made to the place So when performing flat plowing, the plowing done is increased. The plugging suspension device is intended to be used in class 4 and 5 tractors. Disc-shaped knives and support wheels row work released. Wheel plug support adjust mechanism plowman

Depth 22-27 cm within the limit to change to give the opportunity to ladies. Work in Fig. 4 developed closed and half open cutting conditions you do not have a flat fork arable PT -4-45 general appearance described _ Below is given from the table, apparently as it is closed and half open cutting conditions you do not have a flat plowing plug-in all quality indicators agricultural technology requirements a complete suitable one will come. In the tests, the work is developed closed and half open cutting conditions you do not have a flat plow

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marked _ the technological process is reliable and has done this and its serious shortcomings are not observed.

Figure 4. Closed and half open cutting conditions you do not have a flat plowing plug-in experimental copy From the tests, the results obtained are presented in

Table 2. you don't have it flat plowing plugin test results

No	Indicators name	Indicators to appreciate		
		Initial requirements in accordance with	Test Results according to	
			PLN-5-35	**ФП-4-45**
1.	Movement speed, km/h	6-8	7.51	7,62
2.	Covering width: Fireplace cm ± s, cm V, %	±10 см <10	177,4 6.7 3,77	183,2 3.2 1,75
3.	Driving depth: Chimney, cm ± s, cm V, %	until the 25th - <10	25.1 1,89 7.53	24, 3 1, 81 7.45
4.	Plant remains burial completeness, %	>90	93,9	92, 4
5.	Plant remains burial depth: Chimney, cm ± s, cm	>10	12,7 3.2	12, 1 2,9
6.	Next size fractions quantity, % >50 mm 50-25 mm <25 mm	< 10 > 5	5,8 13.1 81,1	5, 1 12,5 82, 4
7.	Comparison fuel consumption, kg/ha	-	25.52	21.21

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Closed and half open cutting conditions you do not have flat plowing plug experience copies agricultural engineer pointers_ PLN -5-35 plug pointers _ _ with almost one another _ However, this plug-in experience copy farmer on farms _ when used _ fuel _ _ costs every one hectares due to PLN -5-35 plug compared to 4.31 kg to ka m.

Summary

Done _ research based on work developed you do not have flat plowing to plug up a certain technological work process reliable did it and his work indicators _ agricultural technology requirements and technical for the task completely _suitable will come. The land in plowing work is developed, you do not have a flat one when a plow is used, fuel and lubricants materials by 21.26% _ the percentage decreases. And this is an opportunity to get an economic result.

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