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FIELD RESEARCH COMBINED CLEANER HEAP ROOT VEGETABLES

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The results of experimental field studies of comparative indicators of improved quality and continuous machine MCP-4.

Care, roots, mass adhering soil, sewage shaft diameter screw, screw rotation speed.

Problem. The need to increase the production of sugar beet production is explained in great demand processing of raw sugar, or the necessity of preserving livestock forage base Ukraine and sale of sugar abroad.

Current Trends root crop development machines (CM) is to improve the quality of the collection of indicators that define the technical level of harvesting machinery, development and production in Ukraine which in recent years has practically stopped. [1].

The main reason for the decline in production efficiency Root is imperfect technique for cleaning and mismatch indicators of quality of sugar beet requirements set by the State Standard of Ukraine [2, 3].

Analysis of recent research. The lack of results and comparative analysis of field research model standards improved root crop machinery MCP-4 to the base of the machine caused these studies.

The purpose of research. - Determining performance and workflow combined cleaner heap of roots compared with baseline indicators KM MCP-4.

Results. One of stocks improve quality raw sugar is to improve the process of cleaning heap of roots by the use of combined treatment

systems that combine cross auger system of circular cross section along over which the drive shaft is designed as a cylindrical drum which is mounted cleaning elastic elements [4].

This will intensify the process of separation of impurities (especially adhering soil) from root crops through the use of additional treatment interaction effect of elastic elements of the body surface roots.

Field comparative study of model standards modernized KM MCP-

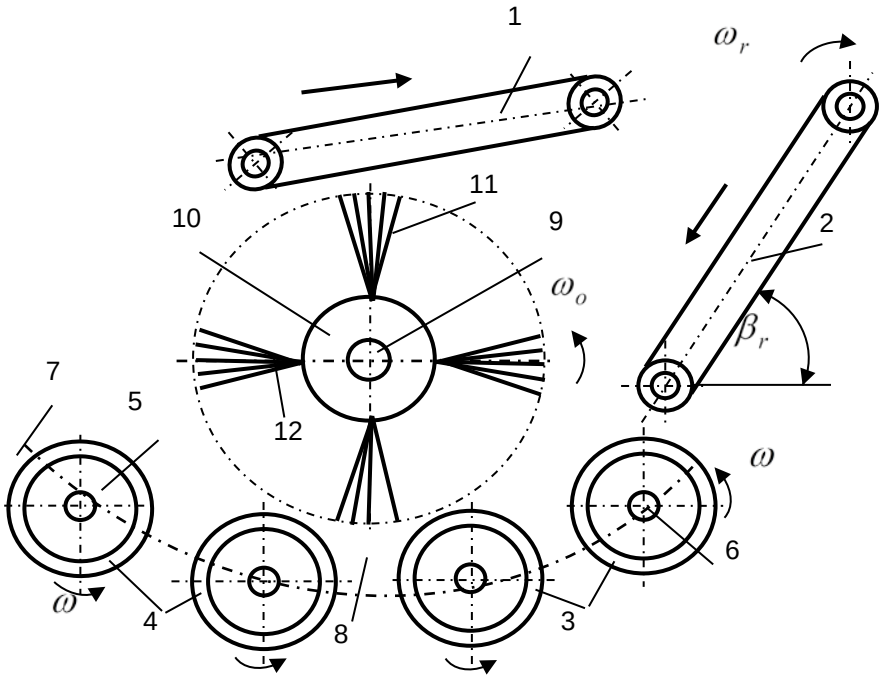

Fig. 1. Construction scheme combined cleaner: 1 - transporter; 2 - bitter; 3, 4 - right and left system; 5 - the screw; 6 - the axis of rotation; 7 - the lower branch of the ellipse; 8 - Trench working channel; 9 - shaft; 10 - drum; 11 - elastic cleaning elements; 12 bundles of cloth

4, which was equipped with a cleaning system heap of roots (Fig. 1) were carried out according to the standard program and method [5].

Upgrade constructive scheme burst KM INC-4 was that instead of the existing cross rod conveyor that moved the Woroch that arrived with slides on discharge conveyor was removed and in its place set combinations cleaner heap.

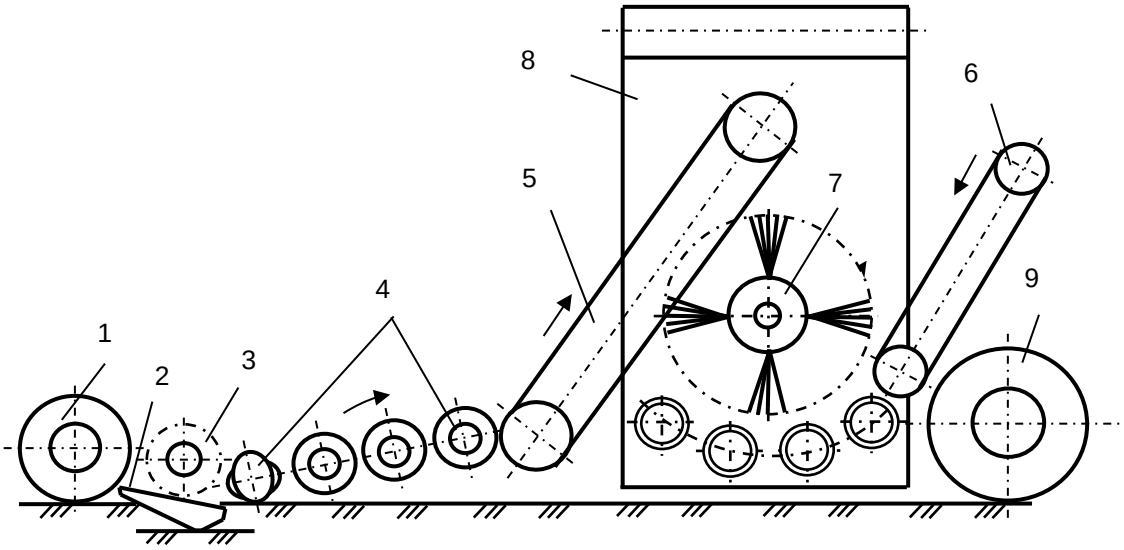

Fig. 2. The design concept of modernized MCP-4: 1, 9 - Copy and support wheel; 2 - digger; 3 - vane shaft; 4 - cleaner heap; 5, 8 - longitudinal and discharge conveyors; 6 - cleansing bitter; 7 - combined cleaner

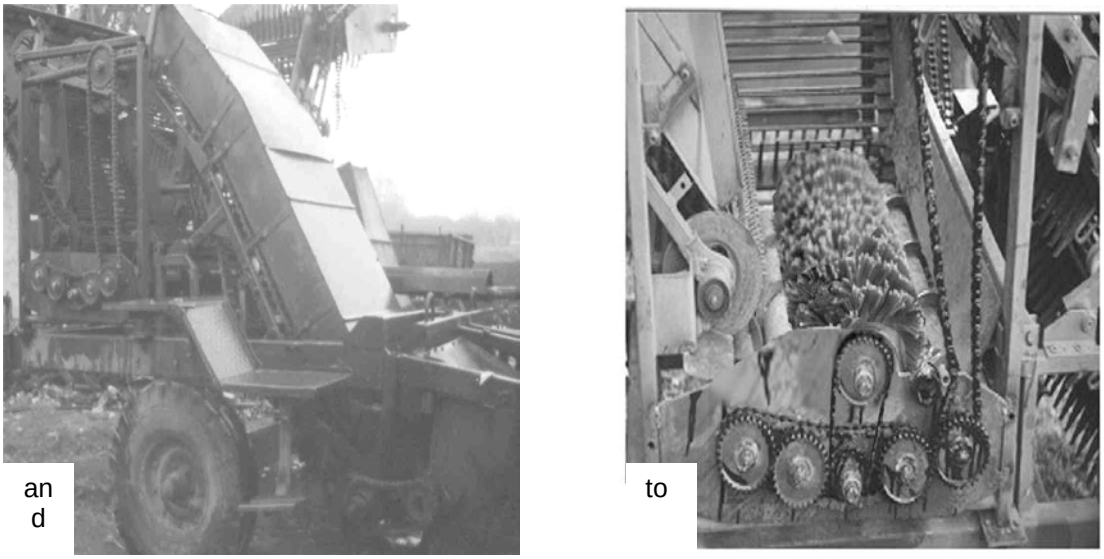

Fig. 4. General appearance: A - upgraded INC-4; b - cleaner combined heap.

Structurally Layouts improved KM MCP-4 is shown in Fig. 2, its overall appearance - in Fig. 3, a general view of the combined cleaner - Fig. 4.

Drive shaft 1 (Fig. 5) cleaning of elastic elements 2 is a drum 3 which is designed as a thin-walled tube 4 with bearing support elements (Fig. 5 not shown). On the surface of the drum in a spiral assigned treatment elastic elements drawn from bundles of cloth. Size-quantitative treatment options elastic elements selected according to the design considerations and taking into account the relevant provisions of the

research work of the brush [6].

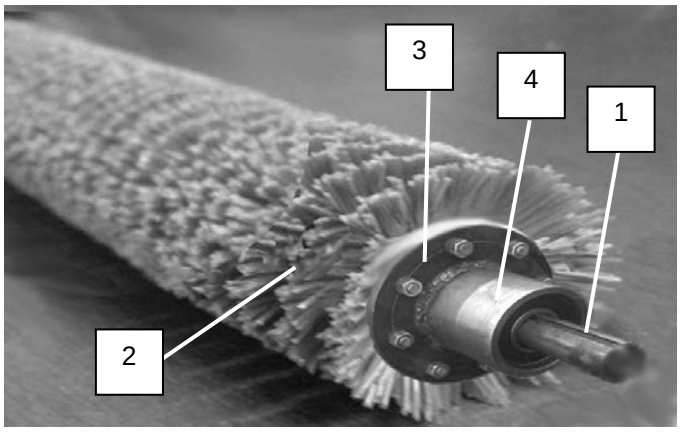

Fig. 5. General view of the drive shaft
of the cleaning elastic elements

Beamforming pile that are made of a polymeric material, conducted as follows: solid billet appropriate length perehynaly half, and next to it a second workpiece formed and so on. Dialed bundles pile using foot tube fixed to the drum shaft in a spiral, coiling direction which is opposite the direction of coiling augers reefs. The diameter of the pile continuous billet was 2 mm, the number of villi in the bunch was 15 units. The solid slabs beams pile on the drum shaft positioned one after another in a spiral, coiling direction opposite turns screw. The outer diameter of the shaft of the cleaning elements calculated according to the set screw diameter.

The modernization process cleaning system is that Woroch Root after sweeping hills east of 6 (Fig. 2) falls on the screws 5 (Fig. 1) combined cleaner 7 (Fig. 2). Moving along the groove of the working channel 8 (Fig. 1) formed by constructive placement centers axes of rotation 6 screws 5, roots rapidly cleared from the soil and plant impurities elastic cleaning elements 11 which form bundles pile 12.

Based on the scientific complex theoretical and previous laboratory experimental studies selected rational structural and kinematic parameters developed combined purifier, which were used in its manufacture and layout of serial CM MCP-4 screw rotation speed - 450 rev / min; screw diameter - 0.22 m; step screw Reef - 0.35 m; Reef height - 0.05 m; the gap between the shafts - 0.05 m; radius curves - 0,75 m; treatment length shafts - 1.14 m; rotational speed of elastic elements treatment - 150 rev / min. Operating speed modernized and serial machines was the same in all cases of field of comparative tests and was 1.5 m / s.

Other indicators of structural and technical characteristics of kinematic parameters of the upgraded machines on technical indicators serial KM MCP-4.

Comparative field study was conducted to determine the technological efficiency of the combined cleaner as a whole and its individual workers as part of the CM.

So the first stage of fieldwork conducted KM without treatment elastic elements, ie data base elements of working cleaner has been removed from the machine by dismantling cleaning shaft. Later determine agronomic performance as the entire Layouts combined cleaner and, based on the relative performance characteristics and improved burst KM, determined the total technological efficiency and cleaner working bodies of the individual.

Tests advanced and basic KM held for one day and in the same soil and climatic conditions.

The procedure for conducting comparative studies of the basic machine, provided sampling and research, which are the same for both machines and the determination of the quality of the cleaning process sugar beet roots and improved basic KM determined under the provisions of [5].

Results agronomic performance indicators of quality of the process of comparative field studies modernized and serial root crop machinery MCP-4 are shown in the table, and the quality indicators defined relative to the mass of the sample roots.

Analysis of the indicators (Table. 1) as digging and picking Root shows that the loss of roots when digging their modernized and serial KM identical and are 1.2%.

In this case the group loss that is attributable to figure Root sprinkled on the surface of the ground field, modernized KM higher than serial MCP-4 is 0.2%, which is realistic because of improved working bodies KM screened onto the surface of the field is much larger (about 2.6 times) free of soil, thus intensively prysypayuchy lost on the field surface roots.

Indicators sylnoposhkodzhenyh Root KM identical and both are 3.5%.

Other indicators of quality of performance of the process shows that the combined use of cleaner designed for serial KM MCP-4 can significantly improve agronomic performance quality of the separation of impurities from the heap of roots compared to the base unit.

1. Quality process implementation and continuous modernized KM MCP-4.

Index name	Value indices *		
	Advanced machine	Serial machine	ATV
Operating speed of the machine, m / s	1.5	1.5	Up to 1.5

Productivity per hour of basic time, ha / year.	1.1	1.1	1.4
Depth pidkopuvannya:			
- Average, see	8.7	8.7	-
- Standard deviation, ± cm	0.93	0.93	-
Pidkopuvannya quality and selection of root crops,%			
- Contains machine	98.8	98.8	98.5
- Loss, total	1.2	1.2	1.5
Including:			
- Not dug Root	0.4	0.4	0.5
- On the soil surface	0.5	0.7	-
- Sprinkled soil	0.3	0.1	-
The composition of the collected heap roots,%:			
- Root	94.8	91.2	-
- Impurity, total	5.2	8.8	8.0
Including:			
- Free soil	1.2	3.1	1.5
- Soil adhering to the roots	1.5	2.9	-
- Plant remains	2.5	2.8	5.5
Damage to roots,%:			
- All	9.6	9.4	20.0
Including heavily damaged	3.5	3.5	5.0

* - Indicators of the quality of implementation of the process defined relative weight of roots; ATV - agronomic requirements KM.

The total amount of impurities collected in vorosi sugar beet roots is reduced by about 1.7 times - from 8.8% to 5.2% sequence in advanced. The amount of soil adhering to the lateral surface of roots decreased almost 2 times that is due to additional process intensification separating impurities from Root elastic cleaning elements combined cleaner.

Also good results comparing the total vegetable impurities and free of soil. They accordingly reduced almost 1.2 and 2.6 times as compared with the figures serial machines, which is achieved by pryhalmuvannya components heap of screws elastic cleaning elements and increase of their time in the gutter channel combined cleaner. Indicators of loss and damage Root same.

From the comparative analysis of indicators of quality of execution of the process (table) we see that the combined application developed purifier can significantly improve the agronomic performance indicators of the quality of the process sugar beet Ratios serial machines.

Conclusion. Based on the analysis of comparative field trials and advanced serial KM can be argued that the combined use of the developed purifier provides significant improvements in separation of impurities from the roots and is a promising direction for further improvement of the process cleaning of root crops developed through the application of a cleaner design-layout schemes KM.

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Results Pryvedenы эksperymentalnыh sravnytelnыh polevыh Quality indicators of research work and usovershenstvovannoy seryynoy mashiny MCP-4.

Cleaner, korneplodы, Mass nalypshey soil, ochystytelnыy shaft diameter auger, auger rotation frequency.

The results of the experimental comparative field researches of indexes of quality of work are resulted improved that serial machine of MKP-4.

Pile cleaner, roots, sticker soil mass, cleaning shaft, screw diameter, screw rotation frequency.

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Of monitoring and quality assurance of technological processes in growing crops

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Information technology and hardware can provide the required quality of manufacturing operations by monitoring the status of agricultural land. For proper performance monitoring of the state agricultural land classification developed monitoring systems, which demonstrates the feasibility of using a particular method of monitoring under certain technological operation.

Precision Agriculture, monitoring technology.

Problem. Agricultural production is characterized by uneven resource distribution in space and time [1, 2, 3]. Therefore, one of the key stages of modern technologies in agricultural production (Fig. 1**Oshybka! Source links not found.**) Is monitoring Agrobiological and