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Opredelena эnerhetycheskaya tselesoobraznost and prospects of production in Ukraine fuel IZ vtorychnoy byolohycheskoy supply.

Byomassa, byotoplyvo, The production, byoэnerhetyka, prospects.

Power expedience and prospects of production in Ukraine of fuel is certain from the second biomass.

Biomass, biological fuel, production, biological energy, prospects.

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MODERN TECHNOLOGY AND ENGINEERING PLANT residues for mulching

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Shows the importance and necessity of grinding and use of plant residues. Posted technical description of the modern Mulch represented in Ukraine manufacturers. Efficiency of organic fertilizers in the soil.

Technology, organic farming, Mulch, specifications, manufacturer, machine assembly, economic efficiency.

Problem. It is known that organic agriculture is based mainly on scientifically based crop rotation, use of plant residues, manure, compost, crop syderalnyh off and use of fertilizers and pesticides. The advantage of organic products in environmental safety. It counteracts

adverse environmental impact, reducing the risk of many diseases. Accordingly, the price of such products to 50% higher [4, 5].

Organic production in Ukraine is at an early stage of development. The area of land under organic farming in our country reaches only 0.66% of the total area of agricultural land, but tends to increase. The leading European countries in this regard are Liechtenstein (26.87%), Austria (18.5%) and Sweden (12.56%) of the total area (Institute Organic Agriculture FIBLE, Ackerstrasse, 2011).

The main source of organic fertilizer is manure. We know that to return organic matter to the soil must per hectare of arable land on the farm have one cow offspring. Unfortunately, cattle since Ukraine's independence in farms decreased in 13.8 times and is according to the State Statistics Service of about 1.5 million. Heads, or 0.08 head of cattle per hectare of arable land. Of organic fertilizers over the same period (1991-2012 years) under agricultural crops decreased almost 22 times and 0.3 t / ha.

Therefore actual problem is a significant increase in cattle and the use of organic fertilizer plant origin.

Analysis of recent research. The content of nitrogen nutrient remains of culture are as follows: stubble legumes, sugar beet tops, stems of corn, straw cereals [2, 3].

For example, a ton of chopped straw deposited on the surface of the field, nutritionally equivalent to 3.5-4 tons of manure. However, please note that to compensate for the nitrogen taken to pereprivannya tons of straw should make 10 kg of active ingredient of nitrogen fertilizers.

The main organic fertilizer plant is chopped straw. For grinding it using mulchers advanced domestic and foreign production. However, information about them scattered and efficiency insufficiently substantiated.

The purpose of research was to reduce labor costs and costs for organic fertilizers in the soil by mulching plant residues.

Materials and methods research. Technical and operational characteristics of modern Mulch systematized and analyzed according to domestic and foreign producers. Economic efficiency technologies and making earnings of organic fertilizers in the soil to substantiate the program and methodology department of technical service and engineering management NUBiP Ukraine [1]. The use of machine units to implement technologies of organic fertilizers in the soil was estimated by productivity, labor costs, fuel consumption and thus led costs. The main criterion of efficiency technologies adopted minimum reduced cost.

Research results. Technical and operational characteristics Mulch leading domestic and foreign manufacturers that meet the quality requirements of agro-technical work, in particular the degree of grinding and uniformity of distribution of the field are given in Table. 1-9.

Mulch provide indicators such as: small particles of less than 100 mm above 80%, the degree of uneven distribution - at least 20%.

These requirements correspond to modern combine harvester equipped with shredding devices and special grinders (Mulch), aggregated with tractors (tab. 1-9 and Fig. 1). However, shredding straw Combine Harvester reduces performance on threshing crops to 15%. Note that mulchers can not just chop straw and stubble and crops (corn, sunflower, etc.).

SPE "BelotserkovMAZ" Mulch offers a trailer and napivnachipnomu variant (Table. 1).

1. Specification Choppers residues SPE "BelotserkovMAZ."

Indicator	Brand		
	PRZ-2.0	Mon-2.0	Mon-4.0
Type	Trailer	Trailed	
Width, m	2.0	2.0	4.0
Operating speed, km / h	8-12	8-12	
Theoretical, ha / h	1,6-2,4	1,6-2,4	3,2-4,8
Weight constructive kg	880	740	1680
Mounted on tractors	MTZ-80		HTZ-17 221

Grind and scatter straw on the field can combine harvesters from shredder machine or PRS-2.1 cells aggregated with a tractor. 1.4 (Table. 2).

When moving the unit along the windrow straw after the combine harvester machine PRS-2,1 picks, crushes and scatters straw, leaving it on the field surface.

2. Specification shredder-spreader Straw PRS-2.1 (according UkrNDIPVT them. Pogorelogo L.).

Indicator	The value of

Constructive width, m	2.1
Operating speed, km / h	Up to 10
Bandwidth spreading straw, m	3.9
Productivity per hour of basic time, ha	3.9
The average size of crushed particles, mm	67.7
Overall dimensions, m:	
- Length	1.96
- Width	2.5
- Height	0.96
Weight constructive kg	775
Attendants	1 (tractor)
Manufacturer	JSC "Berdyansksilmash"

High quality and performance notes Choppers residues NRN 4.5 (Table. 3).

3. Specification Choppers residues PRN-4.5.

Indicator	The value of
Type	Napivnachipnyy
Working width, m	4.5
Productivity per hour of basic time, ha	4.5
The frequency of rotation of the blades, min-1	1000
Dimensions in working position, m:	
- Length	4.85
- Width	4.92
- Height	0.95
Mounted to the tractor, cl.	3
Weight constructive kg	2200
Manufacturer	Krasylivsky Machine Works

By the same technology as the machine PRS-2.1 works in straw rolls 170 MS (Slovenia) (Table. 4).

Practice shows that chopper MS 170 can perform the work of two or four combine harvesters. He grinds the roll of straw cereals and legumes, lupine, rice, sorghum and others. Seasonal shredder operating time reaches 1500 hectares without failure under warranty.

Specifications shredders (Mulch) plant residues US companies and JOHN DEERE RHINO presented in Table. 5 and 6. Mulch RHINO offered hinged and trailed versions. The high density of the cutting blades promotes quality grinding plant remnants and their uniform distribution on the surface of the field. The durability of blades provides superhard alloy steel and tungsten carbide.

4. Specification Cutter MS 170.

Performance	Value indices
Width, m:	

constructive	1.7
Working	6.5
Operating speed, km / h	6-8
Productivity per hour of basic time, ha	3,9-5,2
Type of cutting	The system equal knives and protynozhiv in case
Number of knives, pcs.	64
Number protynozhiv, pcs.	65
Length crushed mass cm	2-3
Throughput, kg / s	4,4-16
Completeness collection,%	97.9
Fuel consumption, kg / ha	1,5-4,2
Weight constructive kg	443

Reliability, quality and productivity in the work of different mulchers KUHN (tab. 7). Depending on the workload buyer can order shredders widths of 2.36; 2.80; 3.23; 4.01; 4.80; 6.10 or 8.20 m.

5. Specification Cutter John Deere 120.

Indicator	The value of
Width, m	6.1
Height grinding (cut), mm:	
minimum	76
maximum	254
Number of knives, pcs.	160
The cross section of the blades, mm	8 × 64
Number crushed per minute	240
The drive of GDP, min-1	1000
Overall dimensions, m:	
width	2.39
height	1.22
- Length	7.34
Weight constructive kg	2100
Required tractor power, kW	125

6. Specification of shredders Rhino.

Indicator	Model				
	RC 12	RC 15	RC 18	RC 20	RC 25
Working width,	3.7	4.6	5.5	6.1	7.6

End Table. 6

Indicator	Model				
	RC 12	RC 15	RC 18	RC 20	RC 25
Number of knives, pcs.	128	168	200	216	272
The drive of GDP, min-1			1000		
Height grinding (cut), mm:					
minimum			25		
- Max			46		

Weight constructive kg	1830	2090	2130	2340	2860
Required tractor power, kW, for option:					
hinged	66	88	96	103	136
- Trailer	59	74	81	88	103

7. Specification of shredders KUHN.

Indicator	Brand						
	RM 240	RM 280	RM 320	RM 400	RM 480R	RM 610R	RMS 820
Working width, m	2.36	2.80	3.23	4.01	4.80	6.10	8.20
The diameter of the rotor, mm	647	647	647	703	620	620	730
Number of V-shaped knife and hammer *	84	96	108	132	168	216	264
Minimum / max-maximal capacity of GDP kW	45 60	52 93	60 103	84 152	110 191	140 221	206 241
Weight constructive kg	1195	1400	1820	2130	2600	3200	6600

*__Note:__ third knives - hammer.

Fig. 1. The unit for grinding plant residues (MF 6499 + RM 610R).

The company also produces KUHN shredders (Mulch) plant remains models ML widths of 2.3; 2,8 and 3,2m and models NK widths of 2.8; 3.2; 4,05 and 4,95m with Hammer V-universal knives.

For crushing plant residues, including hrubosteblovyh cultures can be used Mulch Company Quivogne (France) with vertical (mod. BL), (tab. 8) and horizontal (mod. VR) (tab. 9) rotors.

8. Mulch Specification Model BL.

Indicator	BL 4200	BL 4600	BL 6200	BL 8200	BL 9100	BL 12100
Aggregation method	Trailed			Trailer		
Width, m	4.20	4.60	6.20	8.20	9,10	12,10
Number of rotors / knives	3/9	3/9	5/15	5/15	5/15	7/21
Weight constructive ment, kg	1760	2405	3005	4105	5200	6800
Need a powerful tractor-ness, kW	59	88	147	191	199	221

Quality crushing plant residues Mulch model BL rotor is provided with fastening trylopasnym 3 blades each. Weight knife is 7 kg, which provides high-quality grinding plant residues, including hrubosteblovyh crops (corn, sunflower). Mulch actuated GDP tractor with the rotation speed of 540 or 1000 min-1. When transporting the trailer machine composed using the hydraulic system on the width of not more than 2.9 m.

9. Mulch Specification Model BP.

Indicator	BP 260/1	BP 300/1	BP 360/1	BP 450/2	BP 520/2	BP 600/2
Width, m	2.6	3.0	3.6	4.5	5.2	6.0
Number of rotors	1	1	1	2	2	2
Number of knives	56	64	84	100	116	132
Weight constructive kg	1200	1380	1850	2170	2550	2800
Need a powerful tractor-ness, kW	48	66	96	118	132	147

Mulch BP model is equipped with wide-universal V-shaped knives and hammer for crushing plant residues of maize, sunflower and other crops hrubosteblovyh. Working Mulch authorities have a significant margin of safety and can also be used for crushing bushes trunk diameter and 6 cm. Using the introduction of by-products as organic fertilizer is characterized by the economic efficiency (tab. 10).

10. Comparative cost-effectiveness of technology introduction and earnings of organic fertilizers in the soil.

Techno-logy	Operation	Composition of the unit	Economic indicators of units per hectare			
			Productivity ity for rewards, well, ha	The level of effort, lyud.hod	Wipe-and-pa of passage, kg	LED-Denis costs USD.
r p o r	1. Navanta-	MTZ-80.1 +	44.3 t	0.79	7.0	156.45

	organiza-tion fertilizers night	PS-05/08	(1.27 ha)			
	2. The trans Executive (l = 5 km) and extra-Senna org. fertilizers (35 t / ha)	MTZ-80.1 + MTO-6	0.3	3.33	17.5	831.58
	3. incorporation org. fertilizer into the soil (a = 26 cm)	HTZ-17021 + PO-5	1.1	0.91	18.2	552.48
	Total			5.03	42.7	1540.51
Shredding of plant residues, making mines. fertilizers and minimum tillage	1. shredding-ment Russian-Lynn resh-talk (9 t / ha)	HTZ-17021 + PN-4	3.2	0.31	5.9	124.74
	2. Navanta-tion Saints-eral fertilizers (0.2 t / ha)	MTZ-80.1 + PS-05/08	44.3 t (221.5 ha)	0.01	0.04	0.89
	3. trans Executive (l = 5 km) and extra-Senna min. fertilizer (10 kg active stance re-azo-one per tonne of tailings)	MTZ-80.1 + IDP-6	10.0	0.10	1.0	26.53
	4. minimal tillage m-ny bitok soil (a = 6 cm)	HTZ-17021 + UDA-3,8-20	3.0	0.33	6.3	182.40
	Total			0.75	13.24	334.56

As can be seen from the data, technology making organic fertilizer plant has advantages over solid organic fertilizers (manure) in all economic indicators: lower cost of labor by 6.7 times, fuel consumption - 3.2 and brought costs 4.6 times.

In addition, the plant remains in the form of mulch prevents moisture loss and the action of wind and water erosion.

Conclusions

1. Modern mulchers plant residues domestic and foreign production meet the quality requirements agrotechnical shredding and uniform distribution of the field and can be used as a means of mechanization in the organic farming.

2. Analysis of the effectiveness of technologies making plant residues and solid organic fertilizer to the soil show the advantage of the first of them - less labor costs by 6.7 times, fuel consumption - 3.2 and brought cost - 4.6 times.

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Present Importance and Need yzmelchenyya rastytelnыh ostatkov. Apply commercial-characteristic sovremennыh mulchyvachey predstavlennыh in Ukraine firms - manufacturers. Opredelena Efficiency Technologies vnesenyya of organic fertilizers in the soil.

Technology, orhanycheskoe zemledelye, mulchyvach, commercial-characteristic, machine assembly, Economic effectiveness.

The importance and need of crushing of plants remains is given. The technical characteristics of modern mulching machines presented by firms-producers in Ukraine is given. Technologies efficiency of putting of organic fertilizers to soil is defined.

Technology, organic agriculture, mulching machine, technical characteristics, machine unit, economic efficiency.
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Comparison of theoretical and experimental studies of the dynamics PUSKU Screw conveyor mixer

VS Loveykin, PhD
VM Rybalko, Ph.D.
AV Hudova, applicant

The results of theoretical and experimental studies of the dynamics of motion screw conveyor-mixer during start-up.

The dynamic model optimization criterion, reliability design.