The discrepancy between the theoretical and experimental parameters distribution is negligible, that is random and therefore the theoretical value of the coefficient of readiness assessment is confirmed by experiment.

As a mathematical model of the distribution coefficient of readiness forest MEW that worked depreciation period, with probability P (χ 2) = 0.60, you can use normal distribution with parameters $\overline{K}_{\Gamma} = 0{,}57$ and $\sigma_{K_{\Gamma}} = 0{,}16$. Mean coefficient of readiness of these machines with probability 90% is within 0.50 ... 0.64.

The possibility of analytical estimation of confidence limits availability factor (simple) MEW forest-based F-distribution.

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In this article predstavlenы Results for methodical descriptions provisions Mathematical models Provision Factor readiness lesnыh MЭC.

Funds, Factor readiness lesnoe MЭC.

The paper presents results on methodological regulations describing mathematical models of availability of forest MEM.

Means, Availability, forest MEM.

UDC 631.331.5

TECHNICAL AND ECONOMIC INDICATORS OF improved Actuators Sowing device sown MACHINES

NV Matuhno, competitor *

The paper describes the analytical approaches and describes the prerequisites improve Actuators sowing machines sowing machines.

The device, hanging, car, drive.

Problem. High prices for sowing machines require modern look for ways to reduce the cost of sowing seeds crops. One way is to use variable seeding devices to existing sowing machines, as

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These devices cost less than the cost of specialized drills. Raising the technical level Actuators sowing machines should also help reduce the complexity of their service, improve technical and economic performance.

Analysis of recent research. Output [1-5] for the calculations are summarized in Table. 1.

1. Initial data for the calculation of economic efektyvnostivdoskonalenyh sowing machines beet sowing SST-12B / drive mechanism and zernotukotrav'yanoyi drills NWT-3, 6A.

Characteristic and its unit of measure	The value of	
	basic version	new version
The composition of the unit: - tractor	MTZ-80	MTZ-80
- Beet drill	SST-12B /	SST-12B / converted
- Drill zernotukotrav'yana	NWT-3,6A	NWT-3,6A perebladnana
Price, UAH: - tractor	68000	68000
- Beet sowing	25 290	-
- Sowing zernotukotrav'yanoyi	18 290	-
- Seed disk NI26.17.004	83.9	-
- Universal seed disc with a device for dispensing	-	123.0
- Device STYA 23,000 for sowing millet	45	
- Device JMA 04,000 for sowing small seeds		
Weight drive mechanism sowing machines Sowing NWT-3,6A, kg	3157	
The performance of seed per hour AC unit time, ha	57.5	12.1
Fuel consumption, kg / ha	2.7	2.7
Number of attendants	2.9	2.9
Payment of the tractor, USD / hour	1	1
The annual burden hours:	5.71	5.71
- Tractor		
- Beet sowing	1600	1600
- Sowing zernotukotrav'yanoyi	50	50
Rate deductions for renovation,%	140	140

- Tractor		
- Sowing	10	10
Rate deductions for repairs and maintenance,%	12.5	12.5
- Tractor		
- Sowing	14.9	14.9
Regulatory factors:	7.0	7.0
- Effectiveness of capital investments		
- Transfer prices in the carrying amount	0.15	0.15
	1.2	1.2

The purpose of research. To substantiate the technical and economic indicators improved mechanisms regarding the use of sowing machines sowing machines.

Results. Serial beet drill SST-12B has the following four sets of variables seeding discs: one two one-line and two-line two sets. Two one-line kits allow you sow: one set-fines sugar beet seeds the size of 3.5-4.5 mm, a second set-large seed size fraction 4.5-5.5 mm. A similar purpose with the other two sets of two-line seeding discs. In each of the four sets of sowing includes 12 titles. The total cost of the four sets of sowing drive is:

$$Ц_{4к} = 83{,}9 \times 4 \times 12 = 4027 \text{ грн.}$$

Cost of universal seeding discs for the two factions sowing seeds of sugar beet seed sowing device for grasses and millet.

$$Ц_{ку} = 123{,}0 \times 12 = 1476 \text{ USD.}$$

$$Ц_{б} = 25290 + 3157 + 45 = 28492 \text{ USD.}$$

The total cost of beet sowing in the new version:

$$Ц_{н} = 25290 - 83{,}9 \times 3 \times 12 + 1476 = 23746 \text{ грн.}$$

The cost of 1 kg zernotukotrav'yanoyi drills NWT-3,6A:

$$Ц_{1} = \frac{18290}{1690} = 10{,}82 \text{ грн.}$$

Then the cost zernotukotrav'yanoyi drills NWT-3,6A with improved drive mechanism seeding machines:

$$Ц_{н} = 18290 - 10{,}82(57{,}5 - 12{,}1) = 17799 \text{ грн.}$$

Indicators of economic efficiency of new cars by sowing in accordance with [2].

Expenses for depreciation (+ renovation, repair), maintenance and maintenance of tractors, seeders per hectare sown area defined by the formula:

$$А = \frac{1{,}1 \times Ц(Р + ПР)}{100 \times П \times 3}, \text{ грн/га} \quad (1)$$

where 1,1 - factor costs of transporting machines, maintenance organizations, marketing and distribution; C - tractor sowing price, USD .; P - standard deductions for renovation and refurbishment% related materials; PR - standard deductions of maintenance related matériel%; P - productivity per hour AC unit time, ha.

Zone adopted the same for beet and zernotukotrav'yanoyi seeders. Width beet sowing SST-12 V / 1.5 times the delight zernotukotrav'yanoyi drills NWT-3,6A. But allowable operating speed for sowing of sugar beet compared with sowing cereals and grasses; three-year workload related materials.

According to equation (1) amortization expenses for the tractor by sowing cereals and grasses, and sugar beets base and new seeding units:

$$А_б^т = А_н^т = \frac{1.1 \times 68000(10+14,9)}{100 \times 2,7 \times 1600} = 4,31 \text{ грн/га.}$$

Expenses for depreciation zernotukotrav'yanoyi drills NWT-3,6A in basic version:

$$А_б^{с1} = \frac{1.1 \times 68000(7+12,5)}{100 \times 2,7 \times 140} = 10,38 \text{ грн/га.}$$

Also in the new version with improved drive mechanism seeding machines:

$$А_н^{с1} = \frac{1.1 \times 17799\ (7+12,5)}{100 \times 2,7 \times 140} = \frac{10,10 \text{грн}}{\text{га}}.$$

Expenses for depreciation beet sowing SST-12B / in the base case

$$А_б^{с2} = \frac{1.1 \times 28492(7+12,5)}{100 \times 2,7 \times 50} = 45,27 \text{ грн/га.}$$

Also in the new version of the universal seeding discs and a device for dispensing seeds:

$$А_н^{с2} = \frac{1.1 \times 23746(7+12,5)}{100 \times 2,7 \times 50} = 37,73 \text{ грн/га.}$$

Total costs for depreciation zernotukotrav'yanoyi beet planters and a basic version:

$$А_б^с = А_б^{с1} + А_б^{с2} = 10,38 + 45,27 = 55,65 \text{грн/га} \qquad (2)$$

The same in the new version:

$А_н^с = А_н^{с1} + А_н^{с2} = 10,10 + 37,73 = 47,83$ грн/га .

Total costs for depreciation on tractors and seeders in the base case:

$$А_б = А_б^т + А_б^с = 4,31 + 55,65 = 59,96 \text{грн/га}\,. \qquad (3)$$

The same in the new version:

$$А_н = А_н^т + А_н^с = 4,31 + 47,83 = 52,14 \text{ грн/га.}$$

Costs for fuel and lubricants determined by the formula:

$$ПМ_б = ПМ_н = ВП \times 3,65 = 2,9 \times 4,65 = 13,49 \text{грн/га}\ , \quad (4)$$

where R - average fuel consumption, kg / ha; 4.65 - comprehensive cost of 1 kg of fuel and lubricants, € / kg.

Expenses for salaries tractor per 1 ha of cultivated area:

$$ПР_б = ПР_н = \frac{Т}{П} = \frac{5,71}{2,7} = 2,11 \text{грн/га}\,, \qquad (5)$$

where T - hourly wage tractor, USD / hour; P - performance seed unit, ha / year.

Specific investments on the tractor and sivaltsi:

$$\text{ПК} = \frac{1{,}1 \times \text{Ц}}{\text{П} \times 3} \quad (6)$$

With them on the tractor:

$$\text{ПК}_{\text{б}}^{\text{т}} = \text{ПК}_{\text{н}}^{\text{т}} = \frac{1.1 \times 68000}{2{,}7 \times 1600} = 17{,}31\text{грн/га},$$

baseline option Fertiliser drills:

$$\text{ПК}_{\text{б}}^{\text{с1}} = \frac{1.1 \times 18290}{2{,}7 \times 140} = 53{,}22 \text{ грн/га},$$

baseline option beet sowing:

$$\text{ПК}_{\text{б}}^{\text{с2}} = \frac{1.1 \times 28492}{2{,}7 \times 50} = 232{,}16 \text{ грн/га},$$

on a new version zernotukotrav'yanoyi drills with improved drive mechanism seeding machines:

$$\text{ПК}_{\text{н}}^{\text{с1}} = \frac{1.1 \times 17799}{2{,}7 \times 140} = 51{,}80 \text{ грн/га},$$

on a new version of beet sowing of universal seeding discs and a device for dispensing seeds:

$$\text{ПК}_{\text{н}}^{\text{с2}} = \frac{1.1 \times 23746}{2{,}7 \times 50} = 193{,}49 \text{ грн/га}.$$

Total investments specific to the tractor and sowing machinery basic options:

$$\text{ПК}_{\text{б}} = \text{ПК}_{\text{б}}^{\text{т}} + \text{ПК}_{\text{б}}^{\text{с1}} + \text{ПК}_{\text{б}}^{\text{с2}} = 17{,}31 + 53{,}22 + 232{,}16 = 302{,}69 \text{ грн/га}. \quad (7)$$

Also on the tractor and new versions sowing machines:

$$\text{ПК}_{\text{н}} = \text{ПК}_{\text{н}}^{\text{т}} + \text{ПК}_{\text{н}}^{\text{с1}} + \text{ПК}_{\text{н}}^{\text{с2}} = 17{,}31 + 51{,}80 + 193{,}49 = 262{,}60 \text{ грн/га}.$$

Direct operating costs per hectare of cultivated area is determined by the sum of:

$$\text{ЕК} = \text{А}^{\text{т}} + \text{А}^{\text{с}} + \text{ПМ} + \text{ПР}, \quad (8)$$

where depreciation per hectare of cultivated area on the tractor, € / ha; the same for sowing machines, UAH / ha; PM - costs per hectare for fuel and lubricants, hr. / Ha; PR - Costs of labor tractor, hr. / Ha.$\text{А}^{\text{т}} - \text{А}^{\text{с}} -$

Calculations by the formula (8) for the base variant machines show that the direct operating costs per hectare of cultivated area is equal to the sum of:

$$\text{ЕК}_{\text{б}} = \text{А}_{\text{б}}^{\text{т}} + \text{А}_{\text{б}}^{\text{с}} + \text{ПМ}_{\text{б}} + \text{ПР}_{\text{б}} = 4{,}31 + 55{,}65 + 13{,}49 + 2{,}11 = 75{,}56\text{грн/га} \quad (9)$$

The same for the new version of sowing units:

$$\text{ЕК}_{\text{н}} = \text{А}_{\text{н}}^{\text{т}} + \text{А}_{\text{н}}^{\text{с}} + \text{ПМ}_{\text{т}} + \text{ПР}_{\text{т}} = 4{,}31 + 47{,}83 + 13{,}49 + 2{,}11 = 67{,}74 \text{ грн/га}.$$

The reduced costs are equal to the sum of:

$$\text{ПЗ} = \text{ЕК} + 0{,}15 * \text{ПК}, \quad (10)$$

where 0.15 - efficiency ratio of regulatory capital investments.

For basic sowing units brought costs:

$$\text{ПЗ}_{\text{б}} = \text{ЕК}_{\text{б}} + 0{,}15\text{ПК}_{\text{б}} = 75{,}56 + 0{,}15 \times 302{,}69 = 120{,}96\text{грн/га}.$$

Same for new sowing units:

$$ПЗ_н = ЕК_н + 0{,}15ПК_н = 67{,}74 + 0{,}15 \times 262{,}60 = 107{,}13 \text{ грн/га}.$$

The annual economic effect of the use of sowing machines with improved drive mechanism and universal sowing device defined by the formula:

$$Е = (ПЗ_б - ПЗ_н)З_н \times П = (120{,}96 - 107{,}03) \times (140 + 50) \times 2{,}7 = 7095 \text{ грн.} \quad (11)$$

Limit price sowing machines with improved drive mechanism and sowing device is defined by the formula:

$$ЛЦ = \frac{Е}{0{,}15 + 0{,}11} + 1{,}1 \times Ц_н^м \times \frac{0{,}8}{1{,}2} = \frac{7095}{0{,}15 + 0{,}11} + 1{,}1\ (17799 + 23746) \times \frac{0{,}8}{1{,}2} = 57755 \text{ грн},$$

where 0.15 - efficiency ratio of regulatory capital investments; 0.11 - the share attributable to the renovation of a new car; - The estimated cost of the new$Ц_н^м$zernotukotrav'yanoyi drills with improved drive sowing machines and beet sowing of universal seeding discs and a device for dispensing seeds, rub .; 1.2 - Conversion factor of wholesale prices in the book;
0.8 - rate guarantee consumer economic benefits from the use of new sowing machines.

The economic performance of new and basic sowing machines summarized in Table. 2, and indicators of economic efficiency of new cars presented in Table. 3. The figures in the tables of indicators by using existing methods of economic evaluation of agricultural machinery.

2. The economic performance and improved use of serial seeders for sowing cereals, herbs and sugar beets.

Characteristic and its unit of measure	The value of:	
	basic version	new version
The level of effort, lyud.hod / ha	0.37	0.37
Wages UAH. / H	2.11	2.11
Costs for renovation, major and minor repairs and maintenance		
Costs for fuel and lubricants, hr. / Ha	59.96	59.96
Specific investments, hr. / Ha		
Direct operating costs UAH. / Ha	13.49	13.49
The reduced costs UAH. / Ha	302.69	262.60
Limit price improved sowing machines, UAH	75.56	67.74
	120.96	107.13
	-	57 755

3. Indicators of economic efficacy of sowing machines with improved drive mechanism and universal seeding machines and apparatus for dispensing seeds.

Characteristic and its unit of measure	The value of

Increased productivity,%	0
Reducing direct operating costs,%	10.4
Reducing reduced costs,%	11.4
The annual economic effect UAH.	7095

Conclusion. Application zernotukotrav'yanoyi drills NWT-3,6A with improved drive mechanism sowing machines and beet sowing SST-12B / seeding with universal drives and dosing device would reduce direct operating costs by 10.4%, reduced costs by 11.4% and gives annual economic impact 7095 USD. per one sample machine.

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In Article opysanы analytycheskye approaches and mechanisms opysanы predposыlky usovershenstvovanyya reins vыsevnыh apparatov posevnыh machines.

Apparat, vыsev, car, drive.

In paper analytical approaches are presented and preconditions of development of mechanisms of motive of sowing apparatuses of sowing machines are presented.

Apparatus, seeding, machine, motive.