STUDYING WAYS TO IMPLEMENT NEW WORKING ELEMENTS IN POLYETHYLENE PIPE STRUCTURES AND ACHIEVING ECONOMIC EFFICIENCY AT THE "TURAQORGON PAXTA TOZALASH" ENTERPRISE.

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ABSTRACT:

This article establishes that the quality indicators of cotton have improved due to the use of an erucamide product in the composition of polyethylene instead of existing steel pipes in cotton processing plants. Technologies in cotton ginning enterprises were studied; the processes of damage to cotton fiber during the movement of cotton within a steel pipe were studied. To obtain high-quality cotton fiber and cotton seeds, the Ocylograph unit was used, its advantages and disadvantages were considered, and the degree of damage was studied.

Introduction

Today, one of the requirements imposed on a cotton ginning enterprise is the prevention of damage to cotton fiber during the production process. In the context of emerging new conditions for raw cotton procurement and storage, and the need to store raw materials separately for technical and breeding varieties across cotton-growing farms, the significance of in-plant installations is increasing. This is due to the increase in the number of bunker areas in the new system and the expansion of the vehicle movement zone [1].

The determination of the annual economic effect is based on a comparison of costs for the basic and new designs of pneumatic transport equipment equipped with an air flow parameter control device.

In accordance with Clause 2.2.2 of the Methodological Instruction for calculating the economic effect of implementing scientific, technical, and design work results into production, if the mechanization and application of new technological processes and labor lead to an increase in product quality (class), the calculation of the annual economic effect is performed according to the following formula:

$$Э=[(C_1+E_н\cdot K_1)-(C_2+E_н\cdot K_2)]\cdot A+(Cm_2-Cm_1)$$

where: -$Э$ annual economic effect, thousand soums;

C_1 and - C_2 current costs for variable substances when producing products using base and new machinery, thousand soums;

$E_н$ - regulatory efficiency coefficient of capital structures, 0.15;

K_1 and K_2 -specific capital investments for the base and proposed options, thousand soums;

A - the annual volume of product production in physical units;

Cm_1 and Cm_2 are the cost of products manufactured using base and implemented machinery, thousand soums.

We will maintain accounting only for variable expenditure items [2].

In the proposed variant, the costs for manufacturing the pneumatic transport equipment are 10.0 million soums and electricity costs.

The source data for the account is shown in the table:

Table 1

№	Indicators Name	Unit of measurement	Options	
			Basic	New
1	Number of equipment at the enterprise	meter	25	25
2	Average performance of the air flow control device for pneumatic transport equipment	kg/h	10500	10000
3	Production working hours of a cotton ginning plant (3 shifts, 40 hours per week)	watch	4704	4704
4	Demand coefficient	-	0,7	0,7
5	Annual fiber yield	ton	4800	4800
6	Cost of 1 kW of electricity	sum	450	450
7	Device weight	kg	50	5
8	Energy consumed by the pneumatic transport equipment in which the device is installed:	kWh	75	55

9	Price - one	a thousand rubles	420000	348000

Accounting for capital expenditures

In the basic and new variants of the main capital expenditures, the cost of equipment is taken into account - 420,000 and 348,000 thousand soums.

Additional capital expenditures include equipment transportation and installation (10% of the equipment cost), i.e., 420,000 and 348,000 thousand soums.

The total capital expenditures, taking into account additional capital expenditures in both options, are as follows:

$$K_1 = 420000 + 42000 = 462000$$, a thousand rubles

$$K_2 = 348000 + 34800 = 382800$$. a thousand rubles

Accounting for operating expenses

Accounting is maintained by variable items and consists of deductions and current repair values.

Depreciation charges are determined based on the allocation rate for the main fund and constitute 15% of the equipment cost. Current repair costs are assumed to be 5% of the equipment's cost.

In the base variant, depreciation costs are: $462000 \cdot 0{,}15 = 69300$ *минг сўм*;

жорий таъмирга: $462000 \cdot 0{,}05 = 23100$. a thousand rubles

In the variant being implemented, depreciation costs amount to: $382800 \cdot 0{,}15 = 57420$; a thousand rubles

for current repairs: $382000 \cdot 0{,}05 = 19140$. a thousand rubles

Cost of consumed electricity

The cost of electricity is calculated using the following formula:

$$W = P_у \cdot K_c \cdot T_o \cdot C_э$$

here: $P_у$ – established power of electric motors;

K_c – established power of electric motors;

T_o – equipment operating time, hours:

$C_э$ – Cost of 1 kW of electricity.

Cost of energy consumption for a cotton separator in the base variant $W = 75 \cdot 0{,}7 \cdot 1897 \cdot 450 = 44816625$ сўм $= 44816{,}63$ thousand soums.

In a new version

$W = 55 \cdot 0{,}7 \cdot 1897 \cdot 450 = 32865525$ сўм $= 32865{,}53$ a thousand rubles

Table 1.2 presents current costs in the base and implemented variants.

Table 2.

Current costs in the base and implemented options

№	Consumption name	Cost amount, thousand soums.	
		Basic version	New version
1	Depreciation expenses	69300	57420
2	Current repair expenses	23100	19140
3	Electricity costs	44816,63	32865,53
	Total, $C_{1,2}$	137216,63	109425,53

Determining the benefit from improving the quality of the processed fiber.

In the base and implemented variants, the selling price of the fiber depends on the quantity of defects and trash impurities contained within it. In accordance with UzDSt 604:2016, the fiber is divided into five classes depending on its content of defects and impurities [3].

Based on the obtained data, the implemented device ensures uniform electricity transmission, as electricity consumption is reduced by 15%, and pneumatic pipes are replaced with polyethylene pipes with a diameter of 400 mm and a thickness of 1 cm. This ensures the continuity and efficiency of the work process [4].

The pneumatic transport system of the analyzed cotton ginning plant operates for 1897 hours per year; we determine the difference in energy consumption between the base and new units:

$$C_{m1} = 4704 \cdot 75 = 352800 \text{ kW}$$

$$C_{m2} = 4704 \cdot 55 = 258720 \text{ kW}$$

According to the calculations of the cotton ginning enterprise, the economic benefit from replacing pneumatic pipes with 400 mm diameter polyethylene pipes instead of 400 mm diameter iron ones.

We insert the obtained calculated data into the economic efficiency calculation formula:

$$Э = \left[\left(C_1 + E_н \cdot K_1 \right) - \left(C_2 + E_н \cdot K_2 \right) \cdot A \right] =$$

$$= \left[\left(137216{,}63 + 0{,}15 \cdot 462000 \right) - \left(109425{,}53 + 0{,}15 \cdot 382800 \right) \cdot 1 \right] = 39671{,}1 \text{ минг сўм}$$

The economic benefit from the newly installed pneumatic transport equipment is 39,671.1 thousand soums per year (2022 calculation).

The polyethylene pipes prepared for the experiment were installed in the production process. Experiments and observations were conducted several times during the production process.

1. It has been established that when a polyethylene pipe is used instead of steel, the impact force decreases by approximately 8 times.

2. A design for an experimental unit was developed and manufactured to investigate the influence of the impact surface material on seed damage.

3. Based on experimental data, by adding erucamide to the polyethylene composition, the best material—polyethylene pipe—was selected, and an optimal thickness of 10 mm was adopted.

Experimental results showed that the use of polyethylene pipes in pneumatic transport systems with working surfaces allows for a 3-4-fold reduction in cotton seed damage.

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