the basic relationships and patterns of the process for harvesting and transporting crops.

Key words: expert modeling, multi-criteria optimization, polynomial approximation, self-organization

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ENERGY ASSESSMENT RESULTS TECHNICAL SUPPORT GRAIN CROPS HARVESTING

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Abstract. *The article presents the results of the energy evaluationthe use of modern combine harvesters, depending*

the volume of harvested grain. To analyze the indicators used in gross energy harvesting and the total capacity of the park combine harvesters. As a result of analysis of the dependence of the total fleet capacity combine harvesters from Ukraine variables acreage, yield and average gross yield energy crops.

Keywords: crops, gross yield, zernozby-eral processor, power, energy intensity, energy

Formulation of the problem. For efficient picking crops using modern high-performance combine harvesters of different manufacturers, which differ as indicators of the technical characteristics and quality of the process. In recent decades, the observed upward trend in capacity, bandwidth and weight combine harvesters [1, 2, 3, 4]. Thus, during the years 1990-2004 the average power engines combine harvesters increased from 134.1 to 179.4 kW and kombaynobudivni leading firms produce cars with engine capacity from 80 to 400 kW [5]. With increasing engine power combine increased his weight, fuel consumption and other performance indicators. [3]

According to statistical data and marked an annual growth of gross harvest of grain [6]. In determining the profitability of appropriate conditions for the use of a cleaning machine in addition to important economic evaluation, which is most common in analytical studies, and conduct energy assessment.

Analysis of recent research. The issue analysis combine park devoted to the work of V. Kravchuk, S. Smith, D. Voytyuk A. demo, A. Nadtochiya and many other researchers [1, 5, 7]. The researchers analyzed the fleet of combine harvesters in Ukraine according to the criteria of performance, fuel consumption, power consumption and other indicators. Analysis of the impact of bandwidth thresher combine the mass of the car, engine power, reaper width, the volume of grain hopper parameters threshing-separuvalnoho device shown in [8].

For energy evaluation workflows picking crops used indicators such as total energy process energy intensity of harvest and energy consumption per unit of production. Total energy expenditure is the amount of energy, process materials, hardware etc. per unit of production. [9]

The purpose of research is based on analysis to establish the relationship between power indicators combine the park and the main statistical indicators of growing crops.

Results. For energy evaluation combine fleet in Ukraine in general use as an indicator of overall fleet capacity $N_{\Sigma j}$ (KW) at j-th year, by the formula:

$$N_{\Sigma j} = \sum m_{pj} \cdot N_p \ , \qquad (1)$$

where: m_{pj} - Total number of harvesters brands p Used in j-th year, pcs .; N_p - Engine power harvester brands p according to specifications, kW [10].

Due to lack of basic statistical information on the number of combines various capacities for energy evaluations take a first approximation the value of the total capacity of the park by multiplying the total number of harvesters j-th year m_j (Pcs.) And average engine power combines in the same year N_{CEPj} (KW):

$$N'_{\Sigma j} = m_j \cdot N_{CEPj} \ . \qquad (2)$$

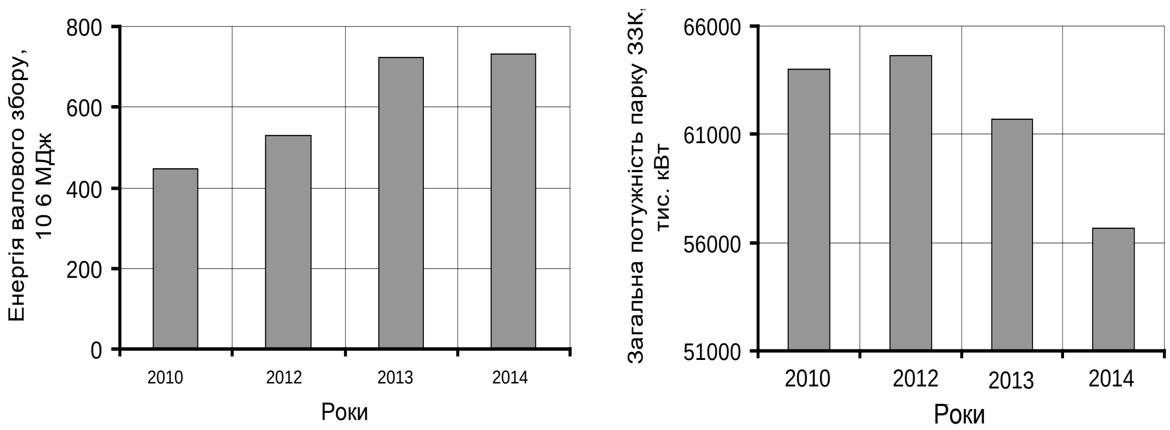
To determine the average power harvesting in j-th year N_{CEPj} make use [5] analysis and extrapolation methods change depending on engine power harvesting.

In total fleet capacity combine harvesters Ukraine significant impact, according to the working hypothesis will have major statistical indicators of growing crops, sown area, total yield and average yield of cereals. Therefore, the nature of energy evaluation will be to determine the relationship between energy performance combine park and the main statistical indicators of growing crops

Data on the total number of harvesters m_j rates and growing crops borrow from annual statistical bulletins [6, 11]. In assessing the impact of the gross grain harvest combine for a total power energy park will use the gross harvest of grain j-th year (MJ), which is determined by the formula:

$$E_{\Sigma jk} = \sum_{i=1}^{k} U_{ij} \mu_i \lambda_i , \qquad (3)$$

where: U_{ij} - The gross i-term culture j-th year t; μ_i - Calorie dry weight of grain i-term culture MJ / t; λ_i - Transfer rate of the basic substance in dry weight (for cereals accept $\lambda_i = 0,86$). This method of determining the energy intensity of harvest is described in [12].



and) b)

Fig. 1. Diagrams energy change of gross harvest of grain crops (a) and the total capacity of the park combine harvesters Ukraine (b) in 2010-2014.

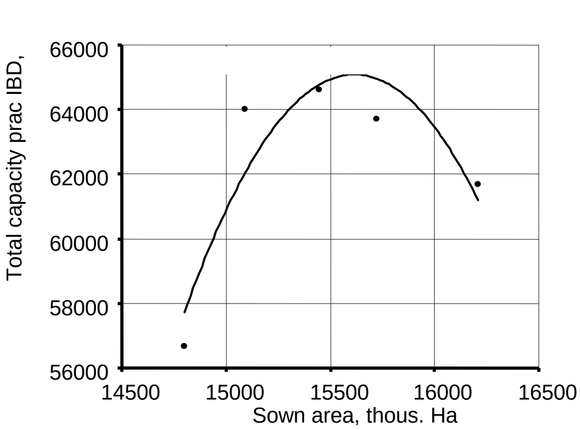
The analysis is built energy change diagrams gross harvest of grain crops and the overall capacity of the park combine harvesters Ukraine in 2010-2014. (Fig. 1), indicating a gradual increase in the rate of the first and second rate reduction by reducing the number of harvesters to increase their productivity , and the annual burden on one machine is also gradually increasing.

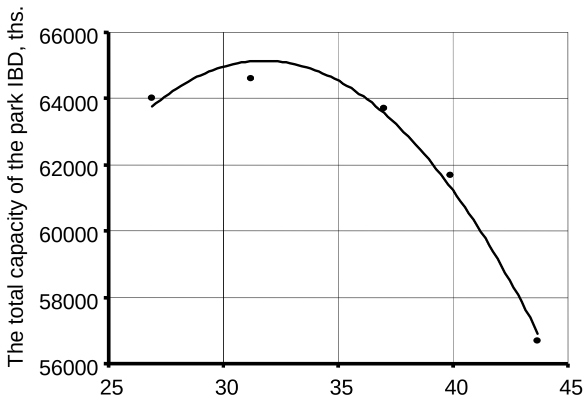
The magnitude of the total capacity of the park combine significant impact also values acreage under grain crops (Fig. 2a) and average yield of cultures (Fig. 2b).

This is the annual growth annual load on each processor, and thus a decrease in their number1000 ha acreage (7 cars in 1996, up 4 - 2013) and the presence of particles of outdated and ineffective cleaning technique combines in total.

Graphic dependence of the total capacity of the park combine harvesters on energy gross grain harvest proves the existence of correlation between these parameters (Fig. 2, B).

When the energy value of a gross grain harvest increase it further leads to reduction of the total capacity of the park, and this, in turn, will optimize the composition combine Park.





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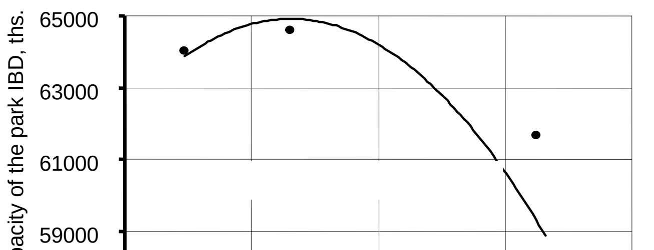

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Fig. 2. Dependence of the total fleet capacity combine harvesters Ukraine in 2010-2014 from major statistical indicators of growing crops: a) cultivated area; b) average yield; c) the gross grain harvest energy

Conclusion. In analyzing the use of modern combine harvesters important addition to economic calculations to perform an energy assessment process by identifying indicators of energy intensity and energy. It is best to use indicators while the total capacity of the park combine harvesters and energy gross grain harvest because they can more efficiently take into account the level of technology and its applications, as well as the value of the harvest of various crops.

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Abstract.*In Article pryvedenы results энerhetycheskoy otsenki of application sovremennыh zernouborochnыh combine in dependence from obъemov sobrannoho grain. For analysis быly yspolzovanы indicators of gross energy crop collection and General zernouborochnыh combine POWER park. As a result of analysis conducted by Global-power dependence poluchenы park zernouborochnыh combine quantities from Ukraine posevnыh Square, an average yield and Gross energy production of grain crops.*

Keywords: Cereal culture, valovaya out production zernouborochnыy combine, power, energy content, энerhoemkost

Annotation.*There are analyzed the results of power estimation of application of modern combine harvesters depending on the volumes of the collected grain in the paper. For an analysis it were used the grain-crops yield energy and the harvesters park general power and found the*

dependences of the general power of harvesters park in Ukraine on the sowing areas, middle yield and the grain-crops yield energy as result.

Key words: grain-crops, gross output, harvester, power, energy yield, energy capacity
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EVALUATION OF PRIMARY MILK PROCESSING UNDER cooperative individual farms

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Abstract.*The paper shows the method of determining the economic effectiveness of the implementation of mechanization initial processing of milk cooperatives in individual households. The conditions under which the mechanization of cleaning, cooling, temporary storage and quality in line with national standards of milk produced by individual manufacturers, is economically feasible. As an example, the conclusions of the specific annual profit for the first processing of milk depending on the productivity of cows, the concentration of livestock in the cooperative market conditions and product implementation.*

Keywords: milk, primary processing, cooperative, quality, efficiency

Formulation of the problem. In manual milking cows source of contamination of milk cows is udder skin, dishes for food storage, room air. In addition milking machine milking cups contaminated milk, milk hoses, taps and so on.

Of course, bactericidal phase storage of crude and non-refrigerated milk is approximately two hours. After this period the milk quickly starts to lose useful properties, increases acidity and bacterial contamination of the product. In this regard, the shelf life of milk without cooling svizhovydoyenoho limited to 2 ... 3 hours. In refrigerated at 10°With milk can be stored for 24 hours at 4°With this time increases to 36 hours.

Calculations show that the cost-effectiveness of cleaning operations, cooling and temporary storage of milk in accordance with the requirements of zootechnical parameters in a large extent depends on the amount of processed food on livestock enterprises. Economic benefit initial processing of milk