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Pryvedeny direction and Main Results issledovatel`skoe scientific work of the department konstruyrovanyya machines.

Science, Studies, Machines, development.

The basic directions and results of research department of designing cars.

Science, research, machine, working.

UDC 629,631,554

BASIC STEPS RESEARCH DEPARTMENT OF TRANSPORT AND TECHNOLOGIES In APC

SG Fryshev, PhD
SI Kozupytsya, Ph.D.

Powered main results of research performed under the development of efficient transportation technologies of grain harvesting in farms and collective farms.

The research, transport and logistics processes, combine harvesters, trailers, restart-pline, car-grain model, efficiency, Consul-tynhovyy package recommendations.

Problem. In general complex agricultural operations and transport handling are the most labor-intensive and energy-intensive processes and account for roughly 1/3 of all labor costs for growing crops and oil costs while reaching up to 40%. In general, specific indicators of domestic supplies of vehicles (cars, tractor vehicles) far from achieved in developed

countries. Note also the low productivity of trucks in Ukraine, which is due largely to the lack of effective agricultural production of innovative technologies, which should be based on the application of logistics principles. At the same time the system SRI NASU no structural unit that investigates transport processes in the system AIC.

Therefore, in 2007 with the aim of training for the agricultural sector, which were able to provide efficient organization of freight transport agricultural products in the process of production and processing, as well as its transport in international traffic of the rules and regulations concerning the safety of road transport, created Department transport technologies and in the technical APC ESI NUBiP Ukraine.

According to the existing variety of means for gathering and transporting the harvest of crops particularly important is the task of selecting the most effective and practically acceptable technologies and technical systems, process optimization collection and transport of agricultural produce from harvesting, by identifying patterns influence the composition, structure and parameters of technical means on complex minimizing costs.

Analysis of recent research. In 2010-2012 at the Department under contract №0110U003630 made to develop efficient technologies moving grain from farmers in harvesting and collective farms.

The purpose of research. Improve the technology and hardware assembly-transport process crops.

Results. To reduce costs, especially for high-duty vehicles, it is reasonable to use technology transport grain handling, which involves

the use of assembly-transport sector (ZTK) consisting of: 1) Combine that function as transport and technological means; 2) trailers reloaders as equalizers between operating; 3) vysokovantazhni vehicles.

On the basis of the balance of time workflows trailer-conveyors (PE) and motor vehicles (ATZ) analytical dependences that can perform rational selection of the number of private and ATZ ZTK for use during handling technology transport grain from HCC. Established rational (margin) capacity bins HCC chain "HCC - PE". This minimum is determined for HCC with a capacity of 9.5; 12.0; 14.5 and 17.0 t / h. capacity bins corresponding HCC from 3.5 to 12 m3. Each interaction with a group of private HCC provides for such a technological line of work, when one serves a private group of HCC, which sequentially (serially) discharged in PP that assigned to them. The rational scheme of operation of combine harvesters, trailers and motor Conveyors Grain configurations for different space fields, which received a patent Ukraine.

For handling technology is the most effective PP with high capacity of 40-50 m3, which can increase the number of HCC, serviced, and reduce the number of members ZTK. Established that PE with a capacity of 26 to 48 m3 serve 3-4 HCC with a capacity of 14.5 - 17 t / h. As the performance to 9,5-12 t / h. number of HCC serviced increased to 5.6 units. The most effective during harvesting crops should determine the use of private and ATZ with equal load capacity.

Harvesting and transportation process functions as a dynamic system in the set of structural and spatial-temporal limits. Her research is primarily concerned with the reasoning characteristics and variables that reflect the characteristics and conditions of the process and its constituent operations, their relationships and variability. As technology works combine complex is considered from the standpoint of functioning as a complex logistics system, the problem of constructing such technology and formulation of criteria for effectiveness we solved using the methodology of system analysis and in particular with the use of inductive technology system information and analytical studies and mathematical modeling of complex systems.

Output for system information and analytical studies (quantitative characteristics of technical and operational characteristics Harvesters-transport complex in the works) for the simulation were obtained during field studies (observational) during harvesting grain handling using technology in households Nikolaev, Kiev and Chernihiv regions in 2010-2012. During the studies assessed a wide range of modern domestic appliances, CIS and foreign countries. During the research developed and applied primary information base, in which were included and classified into groups basic parameters of HCC, PP and ATZ and natural production conditions.

Based on system simulation modeling using logistic plans inductive approach we synthesized econometric model of effective technologies moving grain from harvesting to collection points that are best (optimal from the point of approximation accuracy criterion) way reflect the relationship of the studied processes of transporting grain from economic indicators, the specific technological, financial, climatic, organizational and other conditions.

Optimality criterion and thus select the best solution (technological variant of transportation), selected integral index - aggregate cost of an alternative transport and logistics technologies in the collection and transportation in UAH per 1 ton of grain (ISO 4397: 2005) - Epf.

Examples of these are the result of synthesized model. Model M1, which is the power band information factors on the one hand and the number of options for technological chains, on the other hand, is a powerful objective conditions for the formation of optimal information basis.

Analytical view of the model M1 is:

$$E_{ï ì} = 362,266 - 6,456W_k + 1,042Q_n - 1,070Q_a - 0,545V_a + \\ +4,451T_{pa} - 1,627U - 0,013S - 6,540T + 2,396L \quad (1)$$

where: W_k - Performance combine harvester, t / h;

Qn - trailer capacity-conveyors, t;

Qa - load vehicle, t;

Technical va- vehicle speed in km / h;

Tra - length of stay of the vehicle on the elevator, hours

U - yield crops, t / h;

S - Area Harvested crops, ha

T - the duration of the harvester per day, hours

L - distance transport grain from the field to the milled km.

Model M1, despite its complexity, can be considered the best for practical use in selecting technology logistics of transporting grain from harvesting to final collection points in farms and collective farms.

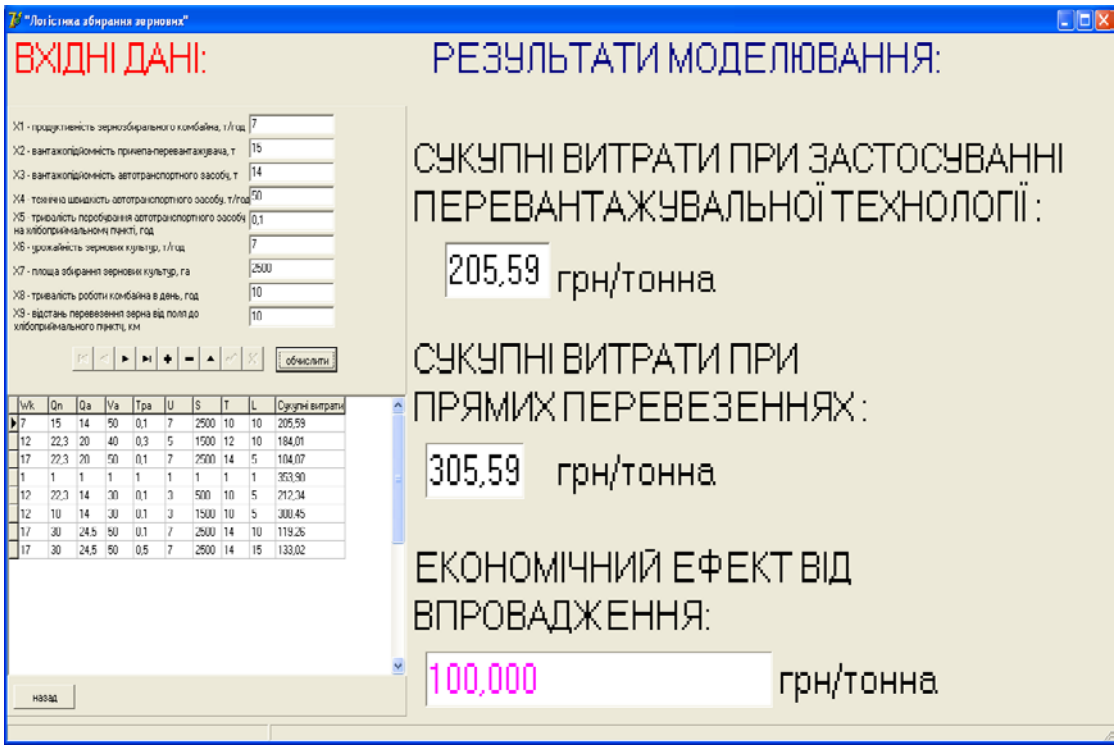
Obtained also M2 model that reflects Direct traffic without reloaders. Total costs in the latter were more significant than in previous versions. Analytical models M2 look like this:

$$E_{ï ì} = 1022,615 + 23,320W_k - 11,964Q_a - 0,891V_a - \\ -40,102T_{pa} - 59,761U - 0,274S + 14,590T + 12,662L. \quad (2)$$

Block modeling and visualization consulting computer-integrated system of total expenditures example of simulation results (for handling technology and direct traffic) is shown in Fig. 1. Total costs for the example given conditions with regard to the handling of technology options were 205.59 UAH / t and options for direct transport 305.59 UAH / t. The economic effect of the introduction of new technology in

comparison with direct transport determined by the difference estimated cost: 100 USD / t.

The recommendations that the rational of assembly-transport sector for sector-specific conditions growers, which allow to optimize the composition of the complex machinery for harvesting and transporting grain from HCC and thus minimize the total cost.



PIP. 1. Block modeling and visualization consulting computer-integrated system of total costs.

The most effective during harvesting crops should determine the use of harvesting handling and transport technology in the application of high-performance systems: HCC, and private vehicles with capacity ranging from 18 to 30 tons.

Found that in typical conditions steppe and steppe zones of the same type is highly harvesting machines and vehicles with the number of units and combines 3-6 rationally picked up including PE and ATZ. Their use can reduce the total cost na60-100 USD. / T compared to direct traffic and reduce the need for cleaning cars involved in 25-30%.

On the basis of harvesting and transport process as a complex logistics system developed consulting package, which includes economic and mathematical (econometric) models, algorithms and software for PCs, enabling a calculation and prediction of system performance and optimize the synthesis and transport chains.

Conclusions

Given the perspective of the results of studies that have been received in the last 4-5 years, the department staff has developed a roadmap for future research:

- Development of mathematical models of multi-functioning prognostic harvesting and transport complexes in the system AIC;
- study the dynamics of the formation, movement and management of material and information flows in the production of SH products;
- qualitative and quantitative research relationships and their optimization in transport and logistics systems APC.

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Pryvedenы Main Results of research nauchnыh In accordance vыpolnennoy technology development эffektyvnыh transport of grain from a combine fermerskyh and kollektyvnыh economy.

Studies, freight lohystycheskye Processes, zernouborochnыe kombaynы, Tractor-trailers overheating-zhately, cars, zernovozы, models, Efficiency, konsaltynhovыy package recommendations.

Powered principal results of research performed in accordance with the development of efficient technologies for the transportation of grain from combines to farmers and collective farms.

Study, of transport and logistics processes, combine harvesters, trailers, cranes, car-grain model, efficiency consulting package recommendations.

UDC 658.51: 631,172

ROLE AND OBJECTIVES OF THE DEPARTMENT OF TECHNICAL SERVICE AND ENGINEERING MANAGEMENT MI. MP MOMOTENKA In deciding INCREASE EFFICIENCY agroindustrial production

VD Voytyuk, PhD

The results of research of teaching staff of the department aimed at improving the efficiency of the performance of tractor fleet by developing a new system of technical service, its assets and facilities as well as prospects for research and development strategy department.

Science, research department, innovation, technical service.

Problem. In connection with the formation in Ukraine agricultural enterprises (AEs) with an extremely wide range of areas of arable land and elimination system "Agriculture", which provides planning and preventive system maintenance (TOR), reduced energy supply mechanized processes and the advent of sophisticated energy-technology different manufacturers, the need develop flexible technical service that would be able to adapt to new conditions of machines, tools and facilities for work with TOR. To solve such a complex problem, in 2001 the structure of the Technical Education and Research Institute was created Department of Technical Service at APC them. MP Momotenka, which in 2007 was reorganized into the Department of Technical Service and Engineering Management.

Analysis of recent research. Over the past decade scientists of the department, as part of the Research Institute of engineering and technology, uniting leading scientists technological research institute,