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ENGINEERING MANAGEMENT SOLUTIONS TO CRITERION OF CHOICE OF COMBINE HARVESTERS

Rogovskii Ivan, PhD

National University of Life and Environmental Sciences of Ukraine, Kyiv, Ukraine

Deep systemic crisis in the agricultural production of the country negatively affected one of the basic industries – grain production. The area under grain crops has decreased according to various reports from 63 million hectares to 42 million, the yield varies between 1.4-1.96 t/ha and the gross grain harvest - that's 67.1 million tons to 116,7 million tons of s to even 130 million tonnes.

Only for the last four years, the cost of production of grain, sugar beets, potatoes increased by 40-45%. The worsening of the economic situation of most households has led to a profound fall in effective demand and, consequently, to a precipitous decline in the production of all types of farm machinery, including grain. The arrival of new combine harvesters in agricultural enterprises of the country with the usual 9,5-10% availability in the Park fell to 2.2 to 2.5%. The Park of grain harvesters decreased from 408 thousand to 158,26 thousand, and windrowers - more than three times. In addition, about 70% of cars older than 10 years. In this Park is extremely difficult to provide adequate availability of the machines to work. In recent years, the season of harvesting of grains and seeds prepared no more than 70-75% of the available harvesters, adding to their acute shortage. Cleaning stretched more than 30 days, the loss increases, grain quality is reduced.

In recent years, leading foreign companies have stepped up the delivery to market of agricultural machinery, especially harvesting machinery. Quite a large fleet of imported combine harvesters formed. In our stable in the past market, numbering 6-8 basic models and modifications of combine harvesters of various classes and bandwidth performance, an influx of many tens, and offer used - and hundreds of models and modifications.

For example, the Claas company (Germany) offers consumers new and used (past a factory repair) combine harvesters Dominator families, Mega 200 and 300 series, Medion and Lexion 400 and 500 series. These families include about 40 models and modifications of the harvesters, mostly the "classic" type (only in the Lexion family includes 4 models with the threshing machines combined type) with a width of harvester that's 3-3,6 to 6.7-9.1 m, the width of the grind from 1060 to 1700 mm hopper capacity from 2.7 to 10.5 m³, and engine power from 105 to 340 kW.

John Deere Corporation (USA) offers combine harvesters nine series, of which there are about 30 models and modifications with the threshers "classic" (series 1000, 2000, 2200, 9000, 9500, 9600, 50), combined (series CTS), and axial-rotary series (STS) types. Width of cutters ranges from 4.25 to 9.15 m, the width of the grind -

from 1300 to 1670 mm, hopper capacity - from 6 to 11 m³, and engine power from 125 to 353 kW.

The combined company With-NH (Case - New Holland) also offers consumers approximately 30 models and modifications of grain harvesters series TS, TX, CS, CX, CR (NH), CT, 2200, 2300, AFX, MDB (Case AQ). Model series TS, TX, CS, CX, CT, MDB have grind "classic", and CR, 2200, 2300 and AFX - axial rotary types. Width of cutters ranges from 3.7 to 4.6 to 7.3-9.15 m, width threshers - from 1040 to 1560 mm, capacity of bins from 4 to 10.5 m³, and engine power from 125 to 315 kW.

About 30 models and modifications of offers consumers firm Laverda (Italy), about ten - Deutz-Fahr (Germany), Massey Ferguson (UK), Sampo Rosenlew (Finland).

The market of combine harvesters came new manufacturers: firms Fendt (Germany), "LAN" and "Slavutich" (Ukraine), production Association "Gomselmash" and "Lidselmash" (Belarus).

On combines one firm, for example Claas, often used different constructive scheme of the harvester (model, V model and folding model 410 and 460) engines of different engine companies (Mercedes Benz, Perkins, Deimler Chrysler and Caterpillar - USA), tires wheels, seven sizes. In these circumstances, a reasonable choice of combine harvesters, needed for effective use in a particular region, is very difficult. In General, firms and companies provide information about the harvesters in the form of handouts, which usually contain technical specifications and a brief description of the design features. These data are not linked with major technological and energy performance. Prospectuses are often overloaded biased information about technology capabilities, many versions and trim levels models of harvesters that do not apply and the appropriateness of the application of which is not proved. The validity of selection also contributes little and a significant number of publications on comparative parameters of the harvesters, their trends, to test results and experience of use in various regions. A simple comparison 50-70 parameters (parameter values) of hundreds of machines of different companies are often very similar constructive-technological scheme, parameters of the basic technological working bodies, devices, and systems that are not linked to the throughput capacity per 1 hour of shift time and the performance measures, the specific energy intensity, fuel consumption, costs of labour and resources per unit (1 ton) of harvested grain, is not a basis for making the right decisions potential consumers of this technology.

In the "trends" appearing in the periodical press, details the long-established the direction of development of designs of combine harvesters. However, they lack analysis of the impact of one or another direction of development on the efficacy of new harvesters. Attempts to link structural parameters of combine harvesters with their capacity and the nominal capacity is not only bring clarity to this question, but often dezinformiruet buyer. Throughput capacity of threshers (the main indicator of the technological capabilities and performance) combine harvester call feed grain straw weight of wheat (with severely limited as humidity, yield and weight of grains) with the ratio of the mass of grains (MZ) and straw (MS) $MZ : MS = 1 : 1.5$ (ratio of

solomitol $b_0 = 0.6$), in which loss of grain grind equal to 1.5% (RM = 1.5%). When other things being equal, it depends on constructive and kinematic parameters of the basic technological working bodies of the combine harvester threshing: threshing and separating system, consisting of the threshing and separating devices and separator coarse Vorokhta and separator small Vorokhta (cleaning). However, in publications directly associated with the engine power and capacity of the combine hopper, which not only increases its value up to 25-45%, but also distorts the very essence of increased "bandwidth".

To improve the validity of selection of combine harvesters and the effectiveness of their application requires:

- analysis of zonal characteristics of the cultivation and harvesting of grain, as well as recommendations for the rational type combine harvesters,
- evaluation of the technical level of domestic and foreign grain combine harvesters.

In addition, it is necessary to establish the degree of conformity of the families of foreign harvesters zonal conditions and cleaning technologies, to consider the complex questions of the effectiveness of domestic and foreign grain combine harvesters:

- organization of the work of harvesting-transport complex,
- setting up of workers on the specific conditions of harvesting,
- reliability and dependability,
- determination of productivity and seasonal development,
- energy conservation in harvesting grain,
- environmental aspects of the use of high-performance harvesters
- economic indicators.

Only a comprehensive approach can search for models that most closely match regional conditions. Even a small error in the selection of harvesters will be for a long period (lifetime) significantly reduce the effectiveness of grain production.