МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
НАЦІОНАЛЬНИЙ УНІВЕРСИТЕТ БІОРЕСУРСІВ І ПРИРОДОКОРИСТУВАННЯ УКРАЇНИ
ІНСТИТУТ МЕХАНІКИ ТА АВТОМАТИКИ АПВ НААН
ДЕРЖАВНИЙ БІОТЕХНОЛОГІЧНИЙ УНІВЕРСИТЕТ

ЗБІРНИК
ТЕЗ ДОПОВІДЕЙ

X Міжнародної науково-технічної конференції з нагоди 116-ї річниці від дня народження
доктора технічних наук, професора,
члена-кореспондента ВАСГНІЛ,
віцепрезидента УАСГН
КРАМАРОВА
Володимира Савовича
(1906-1987)

«КРАМАРОВСЬКІ ЧИТАННЯ»

23-24 лютого 2023 року
м. Київ

4. Liubchenko I. S., Rogovskii I. L. System engineering of self-propelled sprayers of Ukraine. Actual problems of practice and science and methods of their solution. IV International Scientific and Practical Conference, Milan, Italy, January 28, February 2, 2022: conference abstracts. Milan. 2022. P. 588-594.

5. Rogovskii I. L. Methodology of performance of technological operations of restoration of working capacity of agricultural machines at limited resources. Collection of abstracts of the XXII International Scientific Conference "Modern Problems of Agricultural Mechanics". October 16-18, 2021. Kyiv. Nizhyn. 2021. P. 122-125.

УДК 631.001.04

STORAGE OF GRAIN HARVESTERS UNDER CANOPY

I. M. KUZMICH, Post Graduate Student
National University of Life and Environmental Sciences of Ukraine, Ukraine
E-mail: beliy1994@meta.ua

On Ukrainian agricultural holdings [1], grain harvesting equipment is usually stored either outdoors (on hard-surfaced sites) or under sheds (Fig. 1). Due to the impressive size of the units in our country [2], they are rarely stored in closed hangars [3]. But, not all owners of combine harvesters pay due attention to the rules of storage under sheds [4]. As a result [5], certain equipment units quickly fail, and the preparation of the combine for the new season ends with large-scale repairs and missed deadlines [6]. Let's figure out how to keep grain harvesters under a canopy and look at a few important rules that will help save expensive combines and put them into operation as quickly and conveniently as possible after off-season storage [7].

Fig. 1. Equipped storage shed for harvesters.

Basic storage methods for harvesters. In total, there are three ways to store combine harvesters: closed; open; combined. With the closed method, agricultural machinery and all its components with parts are placed in hangars or other specially equipped premises. The main advantage of this option is the minimum time and effort spent on preparing for storage. The disadvantage is the rather impressive financial costs of organizing a room with all the necessary additional equipment (shelves for installing various elements of combines, racks, boxes, etc.). The open method involves the storage of agricultural units on open-air sites. With this option, all removable parts and assemblies are sent to the premises during the off-season. If you follow all the rules of conservation, the method allows you to get the optimal level of protection of units against corrosion and damage. But, this option is suitable only for such agricultural machines as: cultivators, rakes, harrows, rollers, etc.

The combined option is a method of storing combine harvesters, in which agricultural machinery is sent in the off-season to specially equipped open platforms protected by canopies. And all removable components and parts are placed in the warehouse. With this solution, the most commonly used PVC wall. The combined solution has all the advantages of the two previous methods, and is also distinguished by the relative simplicity of organization and minimal financial costs. It is important to understand that if the grain harvesting equipment has aware of more than 70%, it will not be possible to use it for its intended purpose, since it needs a long and expensive repair, restoration of important components and working elements. Therefore, it is better never to bring combines to such a state. To avoid this problem, it is necessary to follow simple and quite feasible storage rules. Let's analyze these rules for equipment that is sent under sheds in the off-season, because in our country this is the most common storage option.

Depending on the specific type of combine harvester, first of all, it must be carefully inspected. All identified serious malfunctions and minor problems with working units, if possible, must be eliminated before being sent under a canopy. After that, all removable parts must be removed, cleaned of contaminants, preserved and sent to a storage room.

Grain harvesting equipment, which is stored under a canopy, must:

1. Carefully and closely inspect at least once a month. And if there was bad weather the day before (strong wind, snowfall, heavy rain, etc.), combine harvesters must be inspected immediately, immediately after the end of the hurricane.

2. Undergo a maintenance check during the inspection. During the off-season, it is necessary to check the condition of: coatings that protect equipment from corrosion, paint, protective elements, covers (strength of fastening), shields, boxes, covers.

3. Be examined for correct installation on treadmills or stands (absence of distortions and deflections, stability, etc.), and sealing reliability (condition of plugs and plugs, tightness of their fit, etc.).

It is also important to monitor the level of tire pressure during the inspection process. All problems and malfunctions that will be identified must be eliminated as soon as possible. At the same time, it is important to remember that all pieces of

equipment that are stored under a canopy must be at a distance of at least 70 cm from each other. A distance of 1 meter must be maintained between the rows for the most convenient access to the equipment.

A canopy is a structure without walls. And if you just put the equipment under this structure, it will be negatively affected by various natural phenomena: rain, snow, wind, dirt, dust, temperature changes, etc. Therefore, it is important to equip the canopy with walls. The best option in this regard is PVC walls. The characteristics of PVC walls make it possible to ensure maximum safety of the units during the off-season. Here are just some of the parameters that this material meets:

- thickness – 0.5 mm;
- operating temperature – from -30 to +70 degrees;
- water-repellent degree – 350 mm. water column;
- sun resistance level – 7-9;
- the average operational period is from 10 to 14 years.

Among the advantages of PVC walls for storing grain harvesting equipment under a canopy: high resistance to strong temperature changes; environmental cleanliness and safety for human health; light transmission up to 99%; good elasticity of the material (no risk of tearing); ease of installation and maintenance; complete elimination of drafts with proper installation.In addition, PVC walls provide maximum protection for equipment from snow and rain, gusts of wind and any other negative natural factors that can harm equipment components. This solution will ensure the safety of combine harvesters and their components in all weather conditions.

References

1. Rogovskii I., Titova L., Novitskii A., Rebenko V. Research of vibroacoustic diagnostics of fuel system of engines of combine harvesters. Engineering for Rural Development. 2019. Vol. 18. P. 291-298. https://doi.org/10.22616/ERDev2019.18.N451.

2. Rogovskii I. L., Titova L. L., Voinash S. A., Sokolova V. A., Tarandin G. S., Polyanskaya O. A. Modeling the weight of criteria for determining the technical level of agricultural machines. IOP Conference Series: Earth and Environmental Science. 2021. Vol. 677. P. 022100. https://doi.org/10.1088/1755-1315/677/2/022100.

3. Rogovskii I. L. Models of formation of engineering management alternatives in methods of increasing grain production in agricultural enterprises. Machinery & Energetics. Journal of Rural Production Research. Kyiv. Ukraine. 2021. Vol. 12. No 1. P. 137-146. http://dx.doi.org/10.31548/machenergy2021.01.137.

4. Rogovskii I. L. Analyticality of complex criteria for estimating grain production in agricultural enterprises by intensification of engineering management. Machinery & Energetics. Journal of Rural Production Research. Kyiv. Ukraine. 2021. Vol. 12. No 4. P. 129-138. http://dx.doi.org/10.31548/machenergy2021.04.129.

5. Rogovskii I. L. Analysis of grain losses by the classic threshing-separating device of the combine harvester. Scientific reports of NULES of Ukraine: electronic

edition. Kyiv. 2021. № 4(92) (2021). https://doi.org/10.31548/dopovidi2021.04.012 file:///C:/Users/Ivan/Downloads/ 15140-35724-1-PB.pdf.

6. Rogovskii I. L. Methodology of performance of technological operations of restoration of working capacity of agricultural machines at limited resources. Collection of abstracts of the XXII International Scientific Conference "Modern Problems of Agricultural Mechanics". October 16-18, 2021. Kyiv. Nizhyn. 2021. P. 122-125.

7. Ivan Rogovskii, Liudmyla Titova, Mikola Ohiienko, Olga Snezhko, Oleksandr Nadtochiy, Ferdynand Raiss, Liudmyla Berezova. Methodology of engineering management of agrotronics of grain production by agricultural enterprises. Monograph. Opole: The Academy of Management and Administration in Opole, 2021; ISBN 978-83-66567-37-5; pp. 214, illus., tabs., bibls. https://www.wszia.opole.pl/wp-content/uploads/2020/09/Mon_Rogovskii.pdf.

УДК 631.372

КОНЦЕПЦІЯ СТВОРЕННЯ ЕНЕРГОТЕХНОЛОГІЧНИХ ТА ЕНЕРГЕТИЧНИХ ЗАСОБІВ ЗАГАЛЬНОГО ПРИЗНАЧЕННЯ ДЛЯ АГРОПРОМИСЛОВОГО КОМПЛЕКСУ УКРАЇНИ

М. М. АНЕЛЯК, кандидат технічних наук, старший науковий співробітник
А. Я. КУЗЬМИЧ, кандидат технічних наук, старший дослідник
Інститут механіки та автоматики агропромислового виробництва НААН
Глеваха, Київської обл., Україна
E-mail: akuzmich75@gmail.com

Пошук відповідних конструктивних рішень для створення модульно-блочних конструкцій енерготехнологічних та енергетичних засобів загального призначення на одній базі з використанням базових прототипів енерогозасобів трактора і мобільних енергозасобів: зернозбиральних, бурякозбиральних і кормозбиральних комбайнів забезпечить зменшення їх питомої матеріалоємності у порівнянні із самохідними машинами та машинно-тракторними агрегатами, збільшення річного завантаження дорого вартісного енергозасобу, а також розширити універсальність їх використання [1]. Проблема незанятості енерогозасобу протягом 9–10 місяців в році, зростання металоємності парку сільськогосподарських машин постійно стоїть перед провідними інститутами галузі та конструкторськими бюро. У загальній постановці рішення цієї проблеми випливає створення універсальних енергозасобів тягового типу, які легко перелаштовувати під набір змінних модульно-блочних конструкцій для виконання всього комплексу робіт по вирощуванню і збиранню зернових культур, кукурудзи, цукрових буряків,