

2. New Holland завоевал два титула «Машина года» на SIMA-2019 [Электронный ресурс]. – Режим доступа: <https://news.ati.su/news/2019/03/01/new-holland-zavoeval-dva-titula-mashina-goda-na-sima-2019-215600/>. – Дата доступа: 20.04.2019.

3. Гольцяпин, В.Я. Основные направления интеллектуализации зерноуборочных комбайнов / В.Я. Гольцяпин // Научно-технический прогресс в сельскохозяйственном производстве: материалы Междунар. науч.-техн. конф., посв. 110-летию со дня рождения академика М.Е. Мацепуро, Минск, 17–18 октября 2018 г. / редкол.: П.П. Казакевич (гл. ред.), Л.Ж. Кострома. – Минск : Беларуская навука, 2018. – С. 281–285.

4. Trelleborg представила систему Variable Inflation Pressure на выставке SIMA 2017 [Электронный ресурс]. – Режим доступа: <http://blog.4tochki.ru/?p=38298/>. – Дата доступа: 20.04.2019.

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PROMISING TRENDS IN AGRICULTURAL VEHICLES MAINTENANCE

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Abstract. The article demonstrates the importance of agricultural machinery maintenance in solving the agricultural industry modernization task. It proves that it is necessary to provide timely and modern maintenance to ensure the high quality of the work of tractors and agricultural machinery. Much attention is given to the main facilities of maintenance complex.

Keywords: smart farming, agricultural vehicle maintenance, preventive maintenance, repair, data acquisition.

Smart farming (SF), based on the incorporation of information and communication technologies into machinery, equipment, and sensors in agricultural production systems, allows a large volume of data and information to be generated with progressive insertion of automation into the process.

The maintenance world is evolving just like anything else around us. New methods, processes, techniques and trends are constantly being developed, tested and implemented. Every company wants to produce as much product as possible, at the lowest cost, with the highest return, at the best efficiency rate and, of course, without running their assets to the ground.

Many farmers use agricultural vehicle maintenance to manage their farming activities. The number of facilities ditching legacy systems, in favour of modern vehicle maintenance is growing by the day.

Modern agricultural machinery maintenance is very crucial for successful agricultural production. It aims the availability of machines, vehicles and related equipment for cultivation operation. Moreover, it is one major cost for agriculture operations [1, p. 75]. Thus, the increased competition in agricultural production demands maintenance improvement, aiming at the reduction of maintenance expenditures while keeping the safety of operations. Preventive maintenance is an extensive term that consists of a set of activities to improve the overall reliability and availability of a system. In general, preventive maintenance activities include inspection, cleaning, lubrication, adjustment, alignment, and replacement of sub-systems and sub-components that are fatigued. Preventive maintenance activities can be classified in one of two ways, component maintenance, and component replacement.

The basic objectives of the maintenance activity are to deploy the minimum resources required to make sure that components perform their intended purposes properly, to ensure system reliability and to recover from breakdowns. The overall maintenance strategy consists of preventive and corrective maintenance programs.

The corrective is carried out when agricultural machinery stop working or failures occur in any of the components. The objective behind preventive maintenance (PM) is to either repair or replace components before they fail. Preventive maintenance includes periodic and condition-based maintenance. An alternative is to lessen against major component breakdown and system failure with condition-based maintenance (CBM). CBM process requires technologies, people skills. So, this involves acquisition, processing, analysis and interpretation of data and selection of optimal maintenance actions and is achieved using condition monitoring systems.

With good data acquisition and appropriate signal processing, faults can thus be detected. Components are operational and appropriate actions can be planned in time to prevent damage or failure of components [2, p. 127].

So it is necessary to use the promising maintenance actions:

- Dynamic monitoring involves measuring and analyzing energy emitted from mechanical equipment in the form of waves such as vibration;
- Corrosion monitoring helps to determine the degree of corrosion, corrosion rate and corrosion state of the active or passive state of the material. The use of this promising technique is very common to control the operation of tillage equipment;
- Radiographic inspection is a nondestructive testing technique used to evaluate objects and components for signs of flaws which could interfere with their function;
- Electrical condition monitoring techniques include measuring changes in system properties such as resistance, conductivity, dielectric strength, and potential;
- Monitoring equipment performance is a condition-based maintenance method that predicts problems by monitoring changes in variables such as pressure, temperature, power consumption, power, and structural components [3].

Machine fault diagnostics is a discovery procedure based on mapping information in the measurement features of machine faults. Detection of a poten-

tial failure will result in diagnostic action which is a proactive activity and usually begins with a condition based maintenance process.

Also steps should be taken to manage any risks arising from maintenance activity. Manufacturer's instructions should make recommendations on how to safely undertake maintenance of their agricultural vehicles and, unless there are good reasons otherwise, these should always be followed. Always plan the job and use safe systems of work whether in the workshop or in the field [4].

The introduction of innovative technology has made a devastating impact on advanced facilities and maintenance management practices, inspiring some key promising maintenance trends likely to shift the industry as a whole in the coming years.

References

1. Bell, Brian. Farm Machinery (6th Edition) / Brian Bell. – Hardcover: Farming Press Limited, 2015. – 308 p.
2. Farm Machinery Repair and Maintenance – A Collection of Articles on Ploughs, Harrows, Drills and Other Farm Machines: Various / Marcel: Marcel Press, 2011. – 258 p.
3. General Maintenance Tips for Farm Equipment [Electronic resource]. – Mode of access: <http://titanoutletstore.com/general-maintenance-tips-for-farm-equipment/>. – Date of access: 16.04.2019.
4. Vehicle repair – Agriculture – HSE [Electronic resource]. – Mode of access: <http://www.hse.gov.uk/agriculture/topics/maintenance-2.htm>. – Date of access: 16.04.2019.

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ELECTRIC TRACTOR

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Abstract. Electric tractor technology offers greater fuel efficiency and reduced emissions. Because of electric motors, tractors have extensive operational life spans. They also have minimal service requirements.

Keywords: tractor, fuel, gasoline, transmission, battery, engine, torque, soil compaction, electric powered robotic platforms, emission, electric motor, line extension, power take-off, speed ratio, spray gun.

Advances in technology and farming practices have helped farmers become much more productive, growing crops efficiently in areas most suitable for agricultural production. Using electric motors in agriculture can help increase efficiency and save the environment. The aim of this research is to determine advantages and disadvantages of electric tractors.