МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ

ДЕРЖАВНИЙ БІОТЕХНОЛОГІЧНИЙ УНІВЕРСИТЕТ

ФАКУЛЬТЕТ ЕНЕРГЕТИКИ, РОБОТОТЕХНІКИ ТА КОМП'ЮТЕРНИХ ТЕХНОЛОГІЙ

КАФЕДРА АВТОМАТИЗАЦІЇ ТА КОМП'ЮТЕРНО-ІНТЕГРОВАНИХ ТЕХНОЛОГІЙ

ЗБІРНИК МАТЕРІАЛІВ

МІЖНАРОДНОЇ НАУКОВО-ПРАКТИЧНОЇ КОНФЕРЕНЦІЇ ЗДОБУВАЧІВ ВИЩОЇ ОСВІТИ І МОЛОДИХ УЧЕНИХ

«ІНФОРМАЦІЙНІ ТЕХНОЛОГІЇ В СУЧАСНОМУ СВІТІ»

21 квітня 2026 р.

м. Харків

МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
Державний біотехнологічний університет
Національний технічний університет «Харківський політехнічний інститут»
Сумський державний університет
Національний університет цивільного захисту України
Харківський національний університет Повітряних Сил імені Івана Кожедуба
Національний університет «Львівська політехніка»
Харківський національний автомобільно-дорожній університет
Національний аерокосмічний університет «ХАІ»
Харківський національний економічний університет ім. С. Кузнеця
Національний університет "Чернігівський колегіум" імені Т.Г Шевченка
Одеський Державний Аграрний Університет
Миколаївський національний аграрний університет
Автономний університет Нижньої Каліфорнії (Мексика)
Військовий інститут імені Гейдара Алієва (Азербайджан)
Академія Сілезії (Республіка Польща)
Національний центр ядерних досліджень (Республіка Польща)

ЗБІРНИК МАТЕРІАЛІВ

Міжнародної науково-практичної конференції
здобувачів вищої освіти і молодих учених

«ІНФОРМАЦІЙНІ ТЕХНОЛОГІЇ В СУЧАСНОМУ СВІТІ»

21 квітня 2026 року

Харків
ДБТУ
2026

UDK 338.43

ANALYSIS OF CURRENT MANUFACTURING TECHNOLOGIES IN THE AGRICULTURAL MACHINERY

Smetankina N.V., DSc., Prof.
Anatolii Pidhornyi Institute of Power Machines and Systems of the National Academy of Sciences of Ukraine
Kharkiv, Ukraine, nsmetankina@ukr.net
Ivanova A.V., Student
State Biotechnological University
Misiura Ie. Yu., PhD, Ass. Prof.
Simon Kuznets Kharkiv National University of Economics

Abstract. The development of new materials and technologies has a significant impact on the quality of agricultural machinery, resulting in machines that are more efficient, durable, and cost-effective. This study analyzes the impact of certain modern processing technologies on agricultural machinery.

Keywords: digital technologies, sustainable development, agricultural machinery; applied research, effective solutions

Information technology is a key tool for sustainable development, enabling ecosystem monitoring, resource optimization, the implementation of new business models, and the digitalization of the energy sector. It improves economic, social, and environmental aspects, fostering the emergence of a “green” economy, increasing energy efficiency, and ensuring sustainable business development [1, p. 46]. New technologies, such as mechanical manufacturing technology, electronic technology, and information technology, have led to the emergence of related industries. Thus, modern processing technologies and the modern manufacturing industry complement each other. Advances in the manufacturing industry can accelerate the research and development of modern processing technologies, while the emergence and application of various modern processing technologies can effectively improve the speed and quality of development [2, p. 506].

Modern manufacturing technologies, such as digital control technology, laser processing technology, virtual manufacturing technology, CNC machine tool technology, and others, are becoming increasingly popular. These modern new processing technologies can not only effectively promote the development of the manufacturing industry, but also improve the efficiency and quality of agricultural machinery production, address issues in traditional processing and manufacturing, develop more high-tech agricultural machinery, and contribute to the development and progress of agriculture. With the rapid advancement of science and technology, agricultural machinery manufacturing technology has reached a new level, and control technology has become relatively mature, incorporating the application of various control system technologies [3, p. 305]. The application of these technologies can also, to a certain extent, improve the control model and its efficiency, thereby contributing to the advancement of agricultural machinery manufacturing. Judging by the actual level of development in recent years, many large agricultural machines

have adopted intelligent and information technologies to improve machine control, which has played an important role in promoting the modernization of agricultural enterprises while simultaneously increasing efficiency. However, overall, there are still significant shortcomings in the application of management, such as a low technical level, low levels of automation and information technology, and so on.

In the actual application of modern agricultural machinery manufacturing technology, the production process is constrained by factors such as raw materials, leading to significant challenges. Consequently, when the practical application of technology and raw materials fails to meet relevant standards, it cannot effectively integrate with modern agricultural production and the manufacturing industry, nor can it fulfill its intended purpose. Furthermore, in some sectors of agricultural machinery production, companies, driven by market considerations, do not pay sufficient attention to the quality of their products in order to capture the market as quickly as possible, which leads to a significant lack of overall precision. Currently, most companies use CAD software to design mechanical equipment or for product redesign, but this technology is not being utilized in practice, a fact that warrants serious attention. Let us examine the actual characteristics of modern machining technology. Agricultural machinery products manufactured using virtual reality processing technology possess strong visualization capabilities, so the effect when personnel and technicians view the products is similar to that of virtual reality goggles. Virtual reality processing technology differs from traditional 3D simulation modeling; it offers a stronger sense of reality and immersion, while the precision and overall quality of agricultural machinery and equipment are enhanced.

Thus, the active application of modern processing technologies in agricultural machinery manufacturing can not only improve processing efficiency and quality but also promote the development of agricultural machinery production toward intelligence and automation, while continuously enhancing the speed and quality of agricultural machinery.

References

1. Malykhina A.I., Merkulov D.O., Postnyi O.V., Smetankina N.V. Stationary problem of heat conductivity for complex-shape multilayer plates. *Bulletin of V.N. Karazin Kharkiv National University. Series "Mathematical modeling. Information technology. Automated control system"*. 2019. Vol. 41, P. 46–54. https://doi.org/10.26565/2304-6201-2019-41-05

2. Smetankina N.V., Postnyi O.V., Misura S.Yu., Merkulova A.I., Merkulov D.O. Optimal design of layered cylindrical shells with minimum weight under impulse loading. *2021 IEEE 2nd KhPI Week on Advanced Technology (KhPIWeek).* 2021. P. 506–509. https://doi.org/10.1109/KhPIWeek53812.2021.956998

3. Ugrimov S., Smetankina N., Kravchenko O., Yareshchenko V., Kruszka L. A study of the dynamic response of materials and multilayer structures to shock loads. *Advances in Mechanical and Power Engineering. CAMPE 2021. Lecture Notes in Mechanical Engineering*. 2023. P. 304–313. https://doi.org/10.1007/978-3-031-18487-1_31