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Бризгалов М.
Тішечкіна К.В.

THE USE OF PRECISION FARMING SYSTEMS FOR THE CULTIVATION OF AGRICULTURAL CROPS IN THE SOUTHERN REGIONS OF UKRAINE AND THE ELIMINATION OF THE CONSEQUENCES OF MAN-MADE DISASTERS

Досліджено та проаналізовано системи точного землеробства, їх застосування у вирощуванні сільськогосподарських культур та подоланні наслідків техногенних катастроф у південних областях України.

__Ключові слова:__ прецизійність, землеробство, південь, Україна, навігація, сенсори, агрономія, урожайність, ресурсозбереження, екологія, відновлення, розвиток, родючість.

The systems of precision agriculture, their application in the cultivation of agricultural crops and overcoming the consequences of man-made disasters in the southern regions of Ukraine were studied and analyzed.

__Key words__: precision, agriculture, south, Ukraine, navigation, sensors, agronomy, yield, resource conservation, ecology, restoration, development, fertility.

The system of precision agriculture plays a crucial role in cultivating agricultural crops and mitigating the consequences of man-made disasters in the southern regions of Ukraine today. We will examine the fundamental principles and technologies that comprise this system, discussing their advantages in enhancing crop yields and reducing negative environmental impacts.

The southern regions of Ukraine are renowned for their fertile soil and favorable climate for agricultural production. However, over time, population growth, expansion of agricultural areas, changes in climate conditions, and man-made disasters threaten the stability and productivity of agriculture in these regions. Therefore, precision agriculture has become highly significant.

Precision agriculture is a modern approach to managing agricultural resources, utilizing information technologies, satellite navigation, sensors, and other tools to collect and analyze data about soil conditions, crops, and weather. Through precision agriculture systems, landowners and farmers can create field maps, enabling informed decisions regarding fertilizer application, irrigation, and other agronomic practices with precision down to individual square meters [1].

Implementing such a system not only enhances agricultural efficiency but also contributes to the sustainable development of rural communities, ensuring food security and stability in agricultural production. It represents an innovative field combining various modern technologies, including drones, computers, and satellites, making precision agriculture a key factor in the success of future agriculture.

In the southern regions of Ukraine, characterized by fertile soils and a favorable climate for agriculture, precision agriculture is particularly important. This regional specificity makes the system even more beneficial and efficient for farmers and agronomists, addressing tasks of varying complexity.

Utilizing satellite navigation and drone data enables effective management of irrigation processes, taking into account soil moisture and weather conditions, which are essential for successful crop growth in these areas. Precision agriculture systems facilitate timely detection of diseases and pests, particularly important for crops susceptible to damage, allowing for prompt intervention to prevent yield losses. Consequently, precision agriculture helps reduce expenses on fertilizers and fuel by optimizing their application and ensuring uniform distribution. Additionally, monitoring systems enable continuous assessment of environmental conditions, preventing soil and water pollution and supporting the ecological stability of the southern regions.

The use of satellites and drones in precision agriculture makes it exceptionally efficient, enabling the collection and real-time analysis of large volumes of data. This technology assists

farmers in making informed decisions and maximizing the potential of agricultural land in the southern regions of Ukraine.

For the southern regions of Ukraine, precision agriculture can be utilized not only in the cultivation of various crops, including grains, vegetables, fruits, and grapes but also in addressing complex tasks such as land restoration after man-made disasters, such as the terrorist attack at the Kakhovka Hydroelectric Station. It allows for detailed monitoring of soil condition and contamination distribution, facilitating the development of optimal plans for land rehabilitation[1].

Therefore, precision agriculture is indispensable for the southern regions of Ukraine, known for their high soil fertility and potent agricultural potential. It has brought numerous significant advantages, including increased crop yields, efficient resource utilization, environmental preservation, improved product quality, and support for the sustainable development of rural communities.

Drones and satellites in precision agriculture open new possibilities for land restoration after man-made disasters, as they help assess the extent of damage, soil and water contamination levels, and monitor the effectiveness of restoration efforts [2], crucial options for the southern regions of Ukraine affected by technological disasters. Additionally, drones provide high-quality imagery and data, simplifying land restoration processes and environmental monitoring.

References:

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