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Language adviser: *Shevchenko S.P., Assistant professor of Foreign Languages Department, Dmytro Motornyi Tavria State Agrotechnological University*

THE LATEST TECHNOLOGIES IN CROP PRODUCTION

Diatkova Y.S., *elizabethdyatkova13@gmail.com*
Dmytro Motornyi Tavria State Agrotechnological University

Scientists have developed a number of hypotheses to explain the historical origins of crop production. They claim that it started when growing crops was necessary for people's needs. At the same time it was the period when they realized importance of implementation of basic technological operations.

In the twentieth century there were three stages that represent improvement of crop production technologies. Stage 1 (from the thirties to the fifties) focuses on growing grain crops by mechanization. Industrial technologies were developed for many crops. Stage 2 (from the fifties to the sixties) was marked by wide use of mineral fertilizers. Stage 3 was the period of pesticide development (the end of the twentieth century). This type of agrochemicals was used to destroy insects, weeds and other organisms that could spoil crop yields [1].

Nowadays special attention is paid to biological technologies which are based on biologization as compatibility between technologies and biological needs of crops. Rapid development of information technologies, geographic information systems and cartographic systems has created conditions for dissemination of advances in informatization into the sphere of crop production into the sphere of crop production. In search of more accurate techniques, farmers have been increasingly applying innovative and widely spread technologies.

The main components of special technical means are geographical information systems (GIS), differential global positioning systems (DGPS) and variable rate technologies (VRT). A geographical information system (GIS) can dramatically help in effective crop yield estimates. As a result, more accurate crop estimates lead to reduction of uncertainty. Moreover, GIS tools and online web resources are used by farmers to manage their agriculture production by satellites. The function of a differential global positioning system (DGPS) in agriculture is to map out crops, map crop yields, control chemical applications and seeding. Variable rate technologies (VRT) are one of many precision agricultural technologies adopted by farmers all over the world. Precision agriculture is a management strategy that uses electronic information and other technologies to gather, process, and analyze data to improve efficiency of agricultural operations. Some PA technologies are becoming standard practice for mechanized agriculture [2]. However, there is very little use of PA on non-mechanized farms in the developing world. The biggest gap in PA adoption is for small farms in the developing world that do not use motorized mechanization [3]. Another important and commonly used indicator in precision agriculture is NDVI (normalized difference vegetation index). It allows you to monitor fields and crops at any point of the globe using satellite images. They tell you a story of plant health and nutrient availability, helping growers pinpoint insect and disease pressures.

In conclusion, despite of crisis in agriculture of Ukraine, implementing of informational technologies is necessary. The application of methods of information technologies will be able to make a significant contribution to meet future global food needs.

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Scientific supervisor: *Bilousova Z.V., Cand. Agr. Sc., Associate Professor of the Department of Crop Production, Dmytro Motornyi Tavria State Agrotechnological University*
Language adviser: *Nisanoglu N.G., Teacher of the Department of Foreign Languages, Dmytro Motornyi Tavria State Agrotechnological University*

SMALL UNMANNED GROUND VEHICLES APPLICATION IN AGRICULTURE

Dioba A.D., *nastiadioba2000@gmail.com*
Dmytro Motornyi Tavria State Agrotechnological University

This article covers the topic of unmanned ground vehicles which are the field scouts adapted to scientific exploration and field conditions. The purpose of the robots is being under the consideration and its abilities are being developed by the leading engineers world-wide.

Field scouting in agriculture is the regular examination of fields to measure pest, humidity levels or reveal diseases affection of the plants. Field robots are built in high quality conditions to ensure future reliability in use. These are the intelligence robots that can be successfully applied in agricultural industry.

The official name of the field scout used for military purposes is SUGV, Small Unmanned Ground Vehicle. It is a remote controlled self-propelled robot. The first robot example was developed by an American company, iRobot in 2008. The first SUGV Early robot model weighed about 13.5 kilograms. The robot was small and movable. That gave it the ability to move quickly and be unobtrusive due to neutral colors, gray, dirty gold, silver. It was equipped with a video camera which had a solid structure and a clear image of the necessary reconnaissance site. Its visual information was transmitted to the control center. SUGV belonged to the PackBot series of military robots developed by iRobot for the DARPA agency.

The SUGV models used today are designed as lightweight robots that can be carried by people. They also have touch sensors. Those sensors enable distinguishing movements and other dangerous factors. The military robots are able to distinguish which weapon was fired by the shot. This ability could be transformed into the advantage for the field scout in agriculture as well.

It is also used to detect explosive devices. The sapper profession fades into the background. This robot provides military operations in urban environments, tunnels, pipes and basements. Those operations could be extrapolated on the rodent destruction. The scout must perform intelligence functions, oversight functions, work in conditions that are dangerous to people, reducing the risks of military personnel. The SUGV can be controlled either with a standard remote control system or with an Xbox 360 gamepad. The robot has the ability to connect additional equipment (plug-and-play). It is so easy to establish and control it. The main goal of the scout robot is to prevent any situations on the field and alert the situation around it.

The analysis of the Small Unmanned Ground Vehicle characteristics developed for the military purposes enabled the conclusion to adapt this robot to the agricultural production. This could remove the human from the field operations and provide automation of the agricultural industry. In this case we could predict that more and more field operations will be controlled by an artificial mind if our