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POSSIBILITIES OF INNOVATIVE DEVELOPMENT OF IRRIGATED RECREATION

The search for modern innovative solutions for the development of irrigated agriculture is aimed at solving a number of problems, among which the main ones are: improving the productivity of irrigation water, increasing the efficiency of using irrigation systems, leveling the negative impact of artificial rain on the soil, reducing the consumption of energy and water resources, and increasing the yield of agricultural crops.

A promising direction in combating water shortages and building the country's food security is "smart irrigation", which involves a differentiated approach to determining irrigation rates depending on the type and properties of soils (different soils have different water retention capabilities). Humidity sensors and weather stations are used, as well as data processing, which allows you to quickly determine the needs of plants for additional watering and determine the most appropriate algorithm of actions in each specific situation. The implementation of the principles of "smart irrigation" allows to obtain annual savings of water resources up to

30% [1], and the preservation of archival data allows to control the situation and helps in making decisions about irrigation.

Domestic sprinkler manufacturers are actively working on implementing the principles of "smart irrigation". In particular, the leader in the production of sprinkler equipment in Ukraine, Variant Irrigation, introduced the system of remote control of circular sprinklers "VI control", which allows remote control of irrigation. Thanks to this system, it is possible to control one or several machines at the same time, start or stop the machine and irrigation, move the equipment to a specified place, track and control water and electricity consumption indicators, regulate the rates and speed of irrigation, etc. In addition, in 2019, the domestic Fregat plant began to expand the functions of irrigation equipment by adding a remote monitoring and control system - the FregatSmart option. Retrofitting the machines with the FregatSmart option will increase costs, but the efficiency and payback indicators will undoubtedly change for the better. Approaching full automation of irrigation is promising. Also, it should be noted about the significant contribution of the Institute of Water Problems and Land Reclamation of the National Academy of Sciences of Ukraine, which developed and implements informational support programs for irrigation on the lands of the Kherson Region.

Foreign companies have even greater achievements in this field. So, scientists from Denmark have developed a "smart" irrigation system for greenhouse complexes. It's about hardware and intelligent software without the need for complicated hardware setup. That is, watering is automated using a patented algorithm. Thus, the use of sensors in the soil and a mobile application made it possible to increase the yield of agricultural crops while simultaneously saving water. Moreover, the system does not require maintenance of the mechanisms, as it is completely digital. 230 thousand dollars were collected for the development of this startup. USA. The innovative SoilSense irrigation optimization system works in Denmark, Sweden, Lithuania, the Netherlands, Hungary, Peru and Kenya [2].

It has been established that interest in irrigation smart technologies is growing in the world: if in 2015 the value of the market was estimated at $0.5 billion. USA, then in 2021 – three times more. In particular, the development company NaanDanJain (Israel) focused on innovative approaches to the placement of irrigation tapes. The location of the irrigation tape in the air for watering apples, pears, peaches and grapes

allows you to irrigate the root system, lower leaves and trunk, as well as the basal soil. By the way, the same company produces patented sprinklers, the service life of which is much longer than analogues. An interesting start-up for full automation of micro-irrigation called Smart Control of Rural Renewable Energy and Storage (SCORRES) (India) was funded by the investment company Innovate UK. A "smart" irrigation plan was developed taking into account the specifics of the area and the growth of various crops. The effectiveness of the mentioned innovation is impressive: a reduction of water consumption by up to 80% and a doubling of the yield of agricultural crops are noted. In addition, the development company Valley Irrigation (USA) is engaged in developments aimed at reducing water consumption due to automatic changes in irrigation rates, since different areas on the same field have different water needs [3].

And, finally, we note that in modern irrigated agriculture, the use of innovative approaches contributes not only to increasing the yield of agricultural crops, but also has an important scientific and practical significance in the directions of rational use of natural resources and reduction of energy consumption.

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ІННОВАЦІЙНІ ЕКОНОМІЧНІ ЗАСАДИ ДЛЯ СТВОРЕННЯ СПРИЯТЛИВОГО БІЗНЕС-СЕРЕДОВИЩА ДЛЯ ВІДБУДОВИ ЕКОНОМІКИ УКРАЇНИ У ПІСЛЯВОЄННИЙ ЧАС

Сучасний стан економіки поставив виклики для бізнес-середовища, та зокрема для суб’єктів підприємницької діяльності, які