

APPLYING INFOCOMMUNICATION TECHNOLOGIES TO AGRICULTURE

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ABSTRACT: During the cultivation of agricultural products on all types of land in Uzbekistan, an automatic management system technology is developed for monitoring their development, automatic irrigation, fertilizing, determination of soil parameters, and the cultivation of each product based on these parameters.

KEYWORDS: Smart sensors, electronic system, automatic detection and execution.

INTRODUCTION

According to the decrees and decisions of the president of our country, starting from 2020, in order to widely introduce market mechanisms in agriculture, complete digitalization, and to increase the interests of farmers and peasants, the cancellation of the state order for the cultivation of cotton and grain and the gradual transition to the procurement system based on market principles were determined. In this regard, the decision of the President of the Republic of Uzbekistan signed on January 28, 2020 “On measures to implement the tasks set in the strategy for the development of agriculture of the Republic of Uzbekistan for 2020-2030 in 2020” and another important direction will be the “Smart Greenhouse” technology program.

THE MAIN FINDINGS AND RESULTS

In advanced agricultural systems, various “smart technologies” (smart-sensors) are installed based on crop and environmental conditions. For example, early detection of pests and diseases, climate control - measuring devices for temperature, humidity, carbon dioxide level, nutrient supply and irrigation devices are included. Their use guarantees an increase in productivity of at least 30 percent. In addition, improved systems will be introduced in the production and marketing chains of agricultural products, and eventually the possibility of collecting large amounts of electronic data will be created. As a result of their storage and analysis, it is possible to effectively use water, land and other limited resources, and ensure the quality and safety of

food. The convenience of the electronic system is that even after the harvest, its activities continue in areas such as product processing, packaging, cleaning, sorting, delivery and creation of other value chains.

The use of sensors and sensors in agriculture - sensors installed at control points are adapted to determine the main systems of soil properties. Sensors provide preliminary information about natural diversity (relief, soil type, light, weather, amount of weeds and pests), diseased plants, productivity.

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Figure 1. Data exchange with sensors.

The "Smart Greenhouse" device is designed to maintain the temperature and humidity of the air inside the greenhouse, as well as the level of sunlight. The device has special sensors that measure temperature and humidity, light level. If the air temperature drops, the heating ovens will start automatically, and if the temperature does not reach the norm, it will warn by voice message. When the temperature is normal, the ovens are automatically turned off. If the room temperature exceeds the norm, the "smart greenhouse" will open the windows by itself. Even then, if the temperature continues to rise, the ventilation system will be activated and the air cooling process will begin. The device, detecting a decrease in soil moisture, automatically performs watering. Various sensors are used to control this process.

This sensor is a DHT11 sensor for measuring temperature and humidity. It is an accurate and inexpensive sensor that includes an ADC to convert analog values of humidity and temperature. An 8-bit microcontroller in the sensor is used for data transmission. This sensor is designed to

check the condition of the land during the cultivation of agricultural crops. The sensor contains a humidity sensor, a thermistor, and a simple analog-to-digital converter for temperature and humidity. Reliable output results are given in an environment with an RH range of 20% RH to 90% and a temperature range of 0°C to 50°C.

CONCLUSION

In the future the project of electronic monitoring of arable lands, pastures and forest areas, the feasibility study and the technical assignment on clearly defining the phases and directions of the transition to the digitization of agriculture will be developed. As a result, production costs in the industry will be reduced by 15 percent. The use of innovative technologies in agriculture is important in areas such as achieving high productivity and quality, reducing water consumption and product costs, planning and forecasting the harvest. At the same time, the introduction of smart technologies arouses interest in this network among representatives of the younger generation. This opens the way for the increase of new jobs in the sector. This technology makes it possible to provide moderate temperature necessary for plants in all four seasons of the year.

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