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AUTOMATION OF THE WORK OF GREENHOUSES

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Abstract
This article covers modern methods of management of greenhouses based on IMRAT (Scientific, Monitoring, Resource Management, Automation and Technology) requirements. The article discusses the scientific approach, real-time monitoring, rational use of resources, the importance of using automation systems and modern technologies for the effective organization of greenhouse activity.

Keywords: Technology, communications, resource, IMRAT, automation, monitoring.

Introduction

Greenhouses play an important role in agriculture, because they make it possible to efficiently organize the cultivation of crops throughout the year. Management of the work of greenhouses requires modern technologies and accurate planning. This article considers the main aspects of effective management of greenhouse activities, in the context of IMRAT (Scientific, Monitoring, Resource Use, Automation and Technology) requirements.

Scientific approach

A scientific approach is important in greenhouse management. The process involves an in-depth understanding of the biological properties of plants, soil analysis, and consideration of climatic conditions. For example, for each type of plant, the optimal temperature, humidity and light conditions must be fixed. Based on scientific research, it is possible to increase the yield by analyzing the growth phases of plants and the factors that affect them.

Monitoring

Monitoring plays an important role in ensuring stable conditions in the greenhouse. Sensors and modern monitoring systems are used for constant monitoring of temperature, humidity, CO2 level and soil moisture. For example, with the help of IoT (Internet of Things) devices

that collect data in real time, it is possible to quickly detect and respond to any changes. Monitoring systems not only prevent errors, but also help in the economical use of resources.

Resource Usage

Rational use of resources in the greenhouse increases productivity. Efficiency is important when managing resources such as water, energy, and fertilizers. For example, drip irrigation systems can reduce water consumption by 30-50\%. Also, the use of alternative energy sources, such as solar power or geothermal heat, reduces greenhouse costs and ensures environmental sustainability.

Automation

Automation simplifies the operation of greenhouses and reduces the human factor. Automatic watering, ventilation and light control systems ensure ideal conditions for plants. For example, automated climate control systems adjust temperature and humidity according to preset parameters. This not only reduces labor costs, but also improves the quality of products.

Technology

The use of modern technologies opens new opportunities in greenhouse management. With the help of drones and artificial intelligence (AI), it is possible to monitor the health of plants, detect diseases early, and predict yields. For example, AI-based analytics systems analyze the growth rate of plants and suggest an optimal management strategy. Also, blockchain technology can be used to track product quality and origin.

Conclusion

Management of greenhouses requires a scientific approach, monitoring, efficient use of resources, automation and a combination of modern technologies in accordance with IMRAT requirements. These approaches not only increase yields, but also provide environmental and economic sustainability. Thanks to the introduction of modern technologies and constant monitoring, greenhouses play an important role in shaping the future of agriculture.

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