

SOLVING THE TECHNICAL MAINTENANCE PROBLEMS OF GREENHOUSE COMPLEXES BY AUTOMATING KEY PRODUCTION PROCESSES

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The agricultural sector is the most promising in the economy and industry of Ukraine, its development is highly profitable and lucrative, but there is a significant feature in crop production. In order to obtain more stable profit during the year, it is necessary to continue production in the off-season period. Greenhouse technology is a typical solution to this problem, but there are a number of technical issues (heating, watering, lighting, ventilation and airing) that need to be addressed.

The purpose of the research is to analyze the main typical solutions and methods of increasing the efficiency and automation of production processes, which will allow to spend minimum efforts to maintain the necessary conditions in the farm and industrial greenhouse complexes.

Modern integrated automation complex systems use a wide range of equipment that tracks air and soil temperature, controls light regime, humidity level, manages plant watering, preparation of nutrient solutions, maintains a microclimate in real time, collects data on the state of technological equipment.

For this purpose, it is necessary to use in the automated control systems such structural elements as: soil insulation; air, steam, gas or infrared electric heating, together with natural heating by solar collectors; filtration drip and mist irrigation using fertilizers; lighting is focused on the blue and red emission spectrum (SHPL lamps, bispectral induction lamps, LED, OLED); ventilation and airing (sliding, moveable, folding); application of frequency converters (expansion of operating ranges control, increase of accuracy of regulation and speed of electric drives, reduction of energy consumption by 13% - 18% in comparison with traditional control schemes).

With modern PLCs, despite the constructive-planning type of greenhouse (hangar or block) and geographic location, it will be possible to implement an adaptive system that can have an upper level of automation with the deployment of automated workplaces for performing operations for the collection and processing of primary information, monitoring and implementation management of these operations.