

Rationale for the Structural Organization of a Computerized Monitoring and Control System for Greenhouse Microclimate Using the Scale Transformation Method

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Industrial greenhouses are complex engineering structures that should provide control and operational management over microclimate parameters that affect the efficiency of evapotranspiration and photosynthesis processes, there by determining the rates of growth, volume and quality of vegetable production. The proposed method of physical modelling of the dynamics of microclimate parameters, in contrast to existing ones, takes into account the complex effect of the regulated list of controlled quantities on photosynthetic efficiency of greenhouse crops. An improved structural and algorithmic organization of a computerized information and measurement system for monitoring and control over industrial greenhouse microclimate has been synthesized, which takes into account the current trends in the development of infocommunication, sensory and microprocessor technologies. A laboratory prototype of an industrial automated greenhouse has been created, which takes into account the conditions for geometric, kinematic and dynamic similarity to real greenhouses. Promising areas of further study of the proposed model of the large-scale transition from the laboratory to the full-scale prototype are identified.

Keywords: *Physical model, Laboratory prototype, Greenhouse, Dimension, Computerized technologies.*