

## **Mathematical Model of Measuring Monitoring and Temperature Control of Growing Vegetables in Greenhouses**

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The main purpose of the article is to improve the mathematical model of the process of computerized measuring monitoring and adaptive fuzzy control of temperature modes of growing crops in greenhouse conditions. The results of the research were obtained using methods of physical and mathematical modelling, theory of differential equations of mathematical physics, theory of thermal conductivity, methods of structural- algorithmic synthesis of complex technical systems. The main purpose of the article was achieved by taking into account types and periods of vegetation of crops and factors of seasonality and engineering design of greenhouses, which allowed substantiating the functional diagram of the system of monitoring and control of temperature in the growing zone. The article establishes regularities of influence of natural sources and technical components of heat energy inputs and losses in greenhouses taking into account current requirements for technological modes of greenhouse operating, which allowed estimating the range of total specific heat energy sufficient for the production. Promising areas for further research of the developed model were proposed in order to increase the integral efficiency of greenhouse farms. The obtained research results can be used as a scientific and applied basis for substantiating ways to optimize energy consumption of industrial greenhouses.

**Keywords:** *energy balance, functional diagram, heat energy, greenhouse complex, microclimate, temperature*