温室湿度动态预测模型建立与试验 Dynamic Forecasting Model of Humidity in Greenhouse

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摘 要： 根据温室内水气收支平衡关系，建立了与室内外气象参数、温室结构、作物生长状况、土壤潮湿程度等有关条件下的温室湿度动态预测模型。同时定量描述了温室内作物蒸腾、土壤蒸发、壁面凝结、自然通风和机械通风等与湿度变化相关的各种物理过程。基于华北塑料连栋温室对所建模型进行了试验验证。结果表明：模型能较好预测温室内空气相对湿度值，预测值和实测值之间的均方根误差为5.9%。 Based on the water vapor balance in greenhouse, a dynamic forecasting model of humidity directly as a function of the inside and outside climate, greenhouse structure, crop growth, and soil moisture was presented. Meanwhile, some physical processes correlative with the water vapor change such as crop transpiration, soil evaporation, covering material condensation, and natural and mechanical ventilation were quantitative analyzed. To validate the correctness of the model, an experiment was carried out in the plastic multi-span greenhouse in North China during winter. The inner relative humidity forecasted agreed well with the measured data, with the root mean square error of 5.9%.

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