عنوان مقاله:

Evaluation of the Modified VegSyst Model to Simulate Growth, Nitrogen Uptake and Evapotranspiration of Pumpkin (Cucurbita pepo L.) Under Different Management Practices

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خلاصه مقاله:

Simulation models can be used for predicting crop behavior under various environmental conditions and management practices. By prediction of crop behavior, it may be possible to adopt management practices which can maximize crop growth and yield. In this study, the VegSyst model which was introduced for simulation of daily crop dry weight (DW), fraction of intercepted PAR (fi-PAR), crop N uptake and crop evapotranspiration (ETc) of vegetables grown under intensively managed greenhouse conditions, was modified by attaching a component for simulation of the daily radiation use efficiency (RUE) and by introducing corrective factors for non-optimum growth conditions in order to apply it under field conditions and various management practices. The modified VegSyst model was calibrated and validated for pumpkin using growth data obtained from four years field experiments (2010, 2012, 2013 and 2014). This model very accurately simulated dry weight, fraction of intercepted PAR, radiation use efficiency, crop N uptake and crop evapotranspiration under optimum conditions for pumpkin growth (i.e. nitrogen rate of 250 kg ha-1, plant density of 2.5 plant m-2 and sowing date between 1-11 May). Under non-optimum growth conditions, model performance for simulating growth parameters of pumpkin was mostly very good or good. Suitable performance of the modified VegSyst model in simulation of DW, fi-PAR, RUE, N uptake and ETc of pumpkin under optimum and non-optimum growth conditions indicated that this model can be effectively used for studying growth of this important medicinal and forgotten crop under different management practices including nitrogen regimes, plant densities and sowing dates.

کلمات کلیدی:

Forgotten crops, Field conditions, Radiation use efficiency, Crop Modeling, Model performance :

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