Evaluation of Soybean Yield by AquaCrop Model under Salinity and Deficit Irrigation Management

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Abstract

Crop models are suitable for simulation of crop yield by different scenarios of deficit irrigation and salinity. In this research, the AquaCrop model was evaluated to simulate the soybean grain yield and biomass under different levels of salinity and deficit irrigation in Gorgan County during 2011 and 2012 growing seasons. The model was calibrated by experimental data of 2011 and validated with data of 2012. The experiment included three irrigation levels of 100%, 75% and 55% water requirement and three salinity levels of 0.7, 5 and 10 dS/m. Statistical indices of the results of validated model including RMSE, E, and d for grain yield were 0.225 ton/ha, 0.88 and 0.97, respectively, and for biomass, they were 0.718 ton/ha, 0.77 and 0.95, respectively. Results showed that grain yield decreased with decrease in the amount of irrigation water and increase in salinity level. Further analysis showed that the sensitivity of AquaCrop model to the canopy decline coefficient (CDC) was more than the other parameters at senescence and maximum canopy cover stages.

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