Abstract

Climate change can affect the Crop yield and water use in agriculture by changing, phenological stage length and evapotranspiration. accoring to the importance of climate change models in the research of climate change, for evaluating the performance of simulation models and choosing the best model for climate change studies on SISTAN region, these ten models BCM2.0،GISS-ER ،CSIROMK3.0 ،CSIROMK3.5 ،CNRMCM3.0 ،HADCM3 ،CHAM5OM ، GFDL،INMCM3.0 ،MIROC3.2medres were chosen and the mean monthly temperature for the case study under A1B scenario were evaluted By using statistical indicators such as Root mean square error (RMSE), Coefficient of determination (CD), Modeling efficiency (EF), Coefficient of residual mass (CRM) Were evaluated. The results of executing each model one by one at the base period showed that GISS_ER ،HADCM3, ECHAM5OM models had the best resulte at simulating mean temperature on base period on zabol region and can be used for predicting future climate change in this region. In the following, according to the evaluating results of climate change models which predicts increasing mean temperature form 2 to 5 celesius degree in zabol, three temperature senarios (zero,+2,+5) respectively were defined as no change in temperature,mininum increase and maximum increase and were added to the daily observed temperature data. The affect of climate change on the growth length, phonological stages and evapotranspiration of wheat and on SISTAN region based on date and varieties for common cultivation has been studied. The GDD method was used for calculating the phenologic stages and the Hargreaves – Samani model was used for measuring the effect of climate change senarios on evapotranspiration. Results showed that by the end of the century by increasing 2 degree,mean daily temperature decreases 14 days in lenght growth of wheat. also evapotranspiration at the first stages of growth will increase 20 percent. Increasing 5 degrees of temperature will decrease the growth length of wheat for 32 days and increase 46 percent evapotranspiration on the first step of wheat growth in the area. . Climate change will affect on wheat production system in SISTAN.

Keywords: GCM, crop model, evapotranspiration, phonology,Climate change

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