4ᵗʰ World Conference on

CLIMATE CHANGE

October 19-21, 2017 | Rome, Italy

Impacts of projected climate changes on soybean production in Karaj Region, Iran

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Climate change significantly affects water resources and crop production in future. However, response of soybean yield and biomass to water stress, and probable changes of temperature, rainfall, and CO_2 rate in each climate region is questionable and still lack of researches worldwide. In this research, two consecutive years of soybean experimental data collected at Karaj Seed and Plant Improvement Institute, and applied to evaluate the capability of the AquaCrop model to simulate soybean final yield, and biomass under projected climate change scenarios. AquaCrop was calibrated in 2010 and validated in 2011 by using four different varieties including L17, Williams*Hobbit, M9, and M7 under three irrigation levels which defined as without water stress (I1), mild water stress (I2), and severe water stress (I3). Statistical analysis, including root mean square error normalized, determination coefficient ($R2$), and paired t-tests showed that simulated and observed values were the same at 95% confidence level. The results represented that AquaCrop had enough credit to predict yield and biomass in this study. Moreover, impacts of climate change assessed by using 15 GCMs output from downscaling model LARS-WG for the periods 2011–2030 centered at 2020, under A1B, A2 and B1 emission scenarios, for 12 treatments. Ensemble means of yield, biomass from AquaCrop output, and under three emission scenarios for future 2020s compared to calibration year in 2010. The results of yield, and biomass showed increasing for most treatments in 2020s.

Biography

Hamidreza Ahmadzadeh Araji, has bachelor's degree in Agricultural engineering (Irrigation). He has also obtained a Master's Degree of Agricultural Meteorology, which he successfully completed at Tehran Islamic Azad University, Branch of Science, and Research. He is Currently PhD student of Water Resources Engineering at UPM. According to his thesis title, he is working on impacts of climate changes on crop production by using crop modeling.

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Notes:

J Earth Sci Clim Change, an open access
ISSN: 2157-7617

Climate Change 2017
October 19-21, 2017

Volume 8, Issue 10 (Suppl)

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