عنوان مقاله:

Simulating G F D L Predicted Climate Change Impacts on Rice Cropping in Iran

محل انتشار:

مجله علوم و فناوری کشاورزی, دوره 3, شماره 2 (سال: 1380)

تعداد صفحات اصل مقاله: 10

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خلاصه مقاله:

Projected global climate change may have a major influence on crop yield. The likely effects of climate change caused by increasing atmospheric carbon dioxide levels on rice yield in Iran were evaluated using a mechanistic growth model for rice, GSAC-rice, running under a climate change scenario predicted for a doubled-CO۲ (۲xCO۲) atmosphere by the Geophysical Fluid Dynamics Laboratory (GFDL) General Circulation Model (GCM). Simulations were run for two locations with contrasting climates, one in the north (Rasht) and one in the south (Ahwaz) of Iran. GFDL predicted that as a result of doubling CO۲ , temperature increases by ۴.۵ and ۴.۶ ۰C during the rice growing season in Rasht and Ahwaz, respectively. Changes in solar radiation are minor, but rainfall during the rice growing season decreases by ۳۸.۸% (۱۰۲ mm) for Rasht and ۶۸.۲% (۵.۸ mm) for Ahwaz. It was predicted that doubling [CO۲] alone increased rice yield by ۳۰%, but that yield decreases by ۳.۷ and ۱۱.۶% for each degree centigrade rise in temperature in Rasht and Ahwaz, respectively. As a result of the combined effect of both doubling [CO۲] and the climate change accompanying it (predicted with GFDL), ۸% greater rice could be produced in Rasht, but irrigation needs would be increased dramatically by ۵۷%. In Ahwaz (the south of Iran), rice production could be halved and might not even remain a viable option unless plant breeders are able to produce more heat tolerant rice cultivars. It was concluded that rice .production in the north and south of the country would change dramatically

کلمات کلیدی:

simulation, Rice, Climate change, Carbon Dioxide