عنوان مقاله:

A Bayesian decision model for drought management in rainfed wheat farms of North East Iran

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خلاصه مقاله:

Drought is a feature of climate that can occur in virtually all climates. Therefore, it is aninevitable global but site-specific phenomenon which requires tools to predict and strategies andoptions to cope with it. In this research, the ability and effectiveness of the Bayesian DecisionNetworks (BDNs) approach in decision-making and evaluating drought management options forrainfed wheat production in the eastern region of Golestan Province, Iran are demonstrated. Theresults revealed that during drought conditions, the Koohdasht cultivar had higher yield thanother cultivars of wheat. Two management scenarios have been specified for the forecastedperiod on the basis of wheat cultivars adopted in the region. The results of scenario analysiswith a BDN model indicate that the probability of low, medium and high yield levels in scenario2 (Koohdasht 70%, Zagros 20% and the other cultivars 10%) has a better status compared withscenario 1 (current condition). The paired t- test indicates that there is a significant differencebetween the two scenarios for wheat yield in low and medium states (P<0.05). Adoptingappropriate cultivars in the region with favourable yield and adaptability to drought conditionsproved to be an effective management action. The BDN approach implemented in this researchserves as a valuable tool to represent the system as a whole, to integrate outputs from modelsand expert judgment, to evaluate the outcomes necessary for decision-making and tocommunicate uncertainty of the parameters in the model.

کلمات کلیدی:

Agricultural drought, Bayesian decision model, SARIMA, Management scenarios, rainfed wheat, Golestan Province