

عنوان مقاله:

The Evaluation of Optimal Water Productivity and Crop Production of Soybean Using two Meta-Heuristic Algorithms

محل انتشار:

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خلاصه مقاله:

The goal of this research is simultaneous optimization of water productivity (WP) and crop production under deficit irrigation management conditions. The data used in this study is the result of an experimental agricultural design conducted in the form of randomized complete blocks design in three replications and seven irrigation treatments in different growth stages in 2010 and 2011 in Karaj. Genetic algorithm was applied as a multi-objective (MOGA) and under two scenarios of the priority of objective functions. Also in order to investigate the application of the simulated annealing algorithm (SA) in combined optimizing of two objective functions of soybean WP and plant production using weight summation method, it converts to a single objective one. The results show under the first scenario conditions, the optimum crop production and optimum WP are 3827 and 3953 kilograms per hectare and 0.53 and 0.58 kg.ha⁻¹ respectively. Also in combined optimization under the second scenario conditions, the amounts of optimum crop production and WP are 3838.053 and 3902.72 kilograms per hectare and 1.124 and 0.75 kilograms per cubic meter per hectare in 2010 and 2011 respectively. Comparison of the obtained results of MOGA and SA indicated that MOGA has a better capability in simultaneous optimization of the two objective functions.

کلمات کلیدی:

Crop Production, MOGA, Simulated Annealing, Soybean, T-test

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