

PARAMETERIZATION AND EVALUATION OF THE AQUA-CROP MODEL FOR FULL AND DEFICIT IRRIGATED MAIZE IN CLIMATIC CONDITION OF KORÇA REGION

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Abstract

Predicting yield is increasingly important to optimize irrigation under limited available water for enhanced sustainability and profitable production. FAO addresses this need by providing a yield response to water simulation model (Aqua-Crop) with limited sophistication. To understand the response to water and to simulate the biomass and grain yield of maize under various water inputs and planting dates, it was tested the FAO Aqua-Crop model versions 3.1 using independent data sets during the cropping seasons of 2010, 2011 and 2012 at Lumalas and Drithas sites in southeastern Albania, Korça region. In this study, Aqua-Crop model was parameterized and tested for maize under full (100%) and deficit (50, and 33% of full) irrigation regimes. A set of conservative parameters (calibrated and validated for maize in a prior study and considered applicable to a wide range of conditions and not specific to a given maize cultivar) were used to further evaluate the performance of Aqua-Crop model for maize using data from two experiments conducted in the region. Good agreement was obtained by Aqua-Crop model in simulating the canopy cover, growth of aboveground biomass, and grain yield in the non-water-stress treatments and mild stress conditions in the two study locations. The model was less satisfactory in simulating severe water-stress treatments especially when stress occurred during senescence. This study provides first estimate values for maize parameters useful for future model testing and use. Model parameterization is site-specific, and thus the applicability of key calibrated parameters must to be tested under different climate, soil, variety, irrigation methods, and field management. The model can also be used in the evaluation of irrigation strategies.

Keywords: *Aqua-Crop model, irrigation, canopy cover, biomass, grain yield*