GC8-Hydro-62, updated on 19 Apr 2024
https://doi.org/10.5194/egusphere-gc8-hydro-62
A European vision for hydrological observations and experimentation

Evapotranspiration partitioning over irrigated wheat in a semi-arid region using in-situ measurements and AquaCrop model.

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Accurate estimation of the partitioning of actual evapotranspiration (ETa) into plant transpiration (Tr) and soil evaporation (E) is difficult but important for assessing biomass production and the allocation of increasingly scarce water resources. This work aims to evaluate the performance of the AquaCrop model to estimate actual crop ETa and its components (Tr and E) over drip irrigated wheat fields in the semi-arid region of Morocco. Field experiments were carried out during 2016-2017 season on an irrigated winter wheat field in semi-arid region of Morocco. Wheat ETa and its partitioning components (Tr and E) were measured by using the eddy covariance (EC) system and the sap flow system (SF). The obtained results showed that the AquaCrop model adequately simulated canopy cover (CC), ETa and wheat biomass. The coefficient of determination (R^2) between observed and measured CC, ETa and biomass were 0.98, 0.72 and 0.98 respectively. With regard to the ETa partitioning, the results indicate that the estimate of Tr using the AquaCrop model is well consistent with those of the in-situ measurements with SF. The Root mean square error (RMSE) between the observed and simulated Tr was about 0.60 $mm.day^{-1}$. This work demonstrates that the AquaCrop model has reliable accuracy in simulating wheat growth, production and ETa partitioning. As a result, this model provides a technical means of application to formulate optimal irrigation schedules.