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Assessment of water and energy balance variations during the drying phase of a wheat crop under semiarid Mediterranean conditions

Rim Zitouna Chebbi (1), Insaf Mekki (2), Frédéric Jacob (3), Laurent Prévot (4), Moncef Masmoudi (5), and Netij Ben Mechlia (6)

(1) INRGREF, Ariana, Tunisia, rimzitouna@live.fr, (2) INRGREF, Ariana, Tunisia, insaf.mekki@laposte.net, (3) IRD, UMR LISAH, Montpellier, France, frederic.jacob@supagro.inra.fr, (4) INRA, UMR LISAH, Montpellier, France, laurent.prevot@supagro.inra.fr, (5) INAT, Tunis, Tunisia, masmoudi.med@inat.agrinet.tn, (6) INAT, Tunis, Tunisia, netij.benmechlia@iresa.agrinet.tn

Non-growing seasons and/or dry periods are very important for the water and energy balances and require a better understanding allowing a realistic description and prediction of hydrologic, agronomical and environmental processes. The main objective of this study is: i) to assess the differences in both energy and water balances during wheat crop and residue drying phase, and ii) to explore the factors that control their variability during the drying phase of wheat crop. This paper is based on in situ data measured at two fields within the Kamech catchment, north-eastern Tunisia (semiarid Mediterranean). The site belongs to the OMERE observatory for environmental research and it is monitored for the different hydrological cycle components under influence of anthropogenic forcing. The field experiment, carried out in May-August 2012, targeted the transition period between the typically wet and dry seasons of semi-arid Mediterranean environments which is important in hydrology. We used the eddy covariance and associated hydrometric measurements to construct energy and water balance at three different sites. The results showed the highly variable response of energy and water balances depending on soil types, land use, and climatic conditions. The evapotransipration ratios differed significantly across site and season. It appears that the soil properties affect the interseasonal water storage below the root zone. The results suggest that further work is required to better understand the underlining mechanisms of environmental controls.