



Estimate of the Crop Coefficients of the FAO-Penman Monteith Evapotranspiration method in an Experimental Field of Padana Plain, Italy

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The evapotranspiration is a key term of the soil water balance for agricultural practices. The commonly used FAO-Penman Monteith “dual crop coefficient” method for the evapotranspiration (ET) estimate uses some key coefficients, which relate the potential ET to soil moisture stress and plant growth and type. These coefficients are also used in an indiscriminating way in all over the world. For this reason, before to apply a soil water balance model based on the FAO-Penman Monteith “dual crop coefficient” method for the ET estimate in the plain area of the Regione Lombardia (northern Italy), an experimental field campaign is being carried out.

A micrometeorological eddy-correlation based station is located in a field cultivated by a typical culture of this region, the maize. The station is equipped with: a 4-component radiometer, a gas analyzer (Licor 7500) and a 3D sonic anemometer necessary for the eddy correlation technique, several soil moistures probes and tensiometers, one rain gauge, heat flux plates and soil temperature for soil heat flux monitoring, and a PAR sensor. Moreover spatially distributed measures of the vegetal growth and of the soil moisture through TDR technique have been carried out over the field periodically.

From ET, soil moisture and vegetation growth measurements new estimates of the FAO-Penman Monteith method coefficients has been provided for the examined area. The new estimates are then used in a soil water balance model based on the FAO-Penman Monteith “dual crop coefficient” method, demonstrating the importance of using on-site measured coefficients.