



Assessing maize crop coefficient through eddy correlation technique in Northern Italy

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The evapotranspiration (ET), also known as latent heat (LE) in energetic terms, has a key role in eco-hydrological processes. Direct measurements of ET, owing to the technique adopted (for instance the lysimeters), were not reliable, nor immediate. For this reason new methods developed by the scientific community suggested to estimate ET from energy budget using atmospheric data and parameters. Among these methods the FAO Penman-Monteith, which is largely diffused, evaluates the potential evapotranspiration of a generic crop as a product of a reference evapotranspiration (ET₀) multiplied by a coefficient *k_c*.

K_c, called crop coefficient, should embody all the physiologic characteristics of a specific plant and should allow to pass from the reference ET₀ to the potential ET of each crop. Such coefficients have been evaluated only in some regions of the planet, which may be quite different from the one in which they are applied. This means that available *k_c* coefficients in literature, despite a correction procedure to adapt them to the local meteo-climate conditions, are yet not completely reliable (Katerji and Rana, 2006). Besides in this context the Eddy correlation technique (eddy-corr for simplicity), was developed in the last years. This method, built through a dimensional analysis application, demonstrated that the latent heat is proportional to the covariance of some measurable atmospheric variables.

The paper discusses the reliability of the *k_c* of maize, assessed by the FAO method comparing it with the eddy-corr analysis.