Assessment Of Agro-Hydrological Models Of Different Complexity To Estimate Crop Water Requirements At Irrigation District Scale

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**Abstract.** Agriculture is one of the main water users in many areas all around the World. For this reason, a correct agricultural water management is a fundamental factor for reaching a sustainable use of the water resources. Despite that, measurements of water withdrawal for agriculture are sparse and limited to the head of few main irrigation districts. Several agro-hydrological models with different complexity have been developed to overcome this limitation. These models have been applied in several studies with good performance and results to support agricultural water management and planning. However, a comprehensive intercomparisons to understand potentialities and limitations are not commonly performed.

In this contribution we present an intercomparison of three agro-hydrological models that are used for agricultural water assessment: IrriFrame, CRITERIA and IdrAgra. The first model has been developed by ANBI (Associazione Nazionale Consorzi di gestione e tutela del territorio e acque irrigue), with the technical coordination of CER (Consorzio di Bonifica di secondo grado per il Canale Emiliano Romagnolo). This model is available as a decision support tools for farmers and Land Reclamation consortia over ltaly. CRITERIA is an agro-hydrological model developed by ARPAe Emilia-Romagna and it is operationally used to estimate crop water requirements and soil moisture over the entire Emilia-Romagna region. Finally, IdrAgra is a distributed agro-hydrological models that has been developed by University of Milano (Italy) and it has been applied in several studies in Lombardia region for the assessment of current practices and future scenarios. The intercomparison is performed at several irrigation districts at Emilia-Romagna region. The results are assessed using measurements of water withdrawals at the head of the districts. Advantages and differences of each model is then presented and discussed.