



Operational Space-assisted Irrigation Advisory Services: the DEMETER project

A. Calera (1), A. M. Jochum (1,2,) and all DEMETER partners

(1) Instituto de Desarrollo Regional, Universidad de Castilla-La Mancha, Albacete, Spain, (2) ALFAclima Asesoramiento Medioambiental, Albacete, Spain

Saving water in irrigated agriculture (where 75% of water is used worldwide) can be achieved through the use of EO-derived information in operational irrigation scheduling at farm and field scale. End-users of the information are the farmers, who experience benefits in the form of "more crops per drop" (enhanced water productivity) and "more jobs per drop" (boost of rural development). Space-assisted Irrigation Advisory Services at community level provide the EO-derived irrigation scheduling information to them, interacting with water management decision makers at river basin level, and serving as a potential policy instrument at national and European scale.

The project DEMETER (DEMONstration of Earth observation TEchnologies in Routine irrigation advisory services, www.demeter-ec.net, co-funded by the European Commission under contract EVG1-202-CT-00078) has been designed to assess and demonstrate improvements introduced by Earth observation (EO) and Information and Communication Technologies (ICT) in farm and Irrigation Advisory Service (IAS) day-to-day operations.

The major improvement achieved by the use of EO in the generation of basic IAS information products like crop coefficients is twofold. Firstly, the spatial coverage is enhanced significantly, both extending to larger areas and providing within-field heterogeneity information. Secondly, the spatially resolved EO data can easily be combined with cadastral information in a geographical information system (GIS), which allows for personalization of the irrigation scheduling recommendation. Conventional IAS provide average irrigation recommendations per crop type, while the new space-assisted IAS is able to provide specific recommendations for each individual plot, based on the actual state of that plot.

The incorporation of leading-edge information technology gives rise to a qualitative and quantitative jump in the information supply to the farmer. It allows for transmitting not only the traditional irrigation scheduling information in improved and personalized form, but also a wide range of additional information that is of relevance to the farmer. The easy-to-use information products, transmitted to the farmer, are easily accessible and stimulate their use by the farmers. Farmers can opt to receive a wide variety of products, tailored to their needs and infrastructure, ranging from simple irrigation scheduling recommendation (irrigation volume, time) to color-coded images (providing quick intuitive information on the crop vigour within their plots), both on PC and/or mobile phones.

The DEMETER concept of near-real-time delivery of EO-based irrigation scheduling information to IAS and farmers has proven to be valid. The Space-and ICT-assisted IAS (e-SAIAS) has been implemented in three pilot zones (in Spain, Portugal, and Italy). The operability of the space segment was demonstrated during the 2005 irrigation season. Extra-fast image delivery and quality controlled operational processing make the EO-based Kc maps available at the same speed and quality as ground-based data (point samples), while significantly extending the spatial coverage and reducing service cost. Complete, high-quality datasets for the entire irrigation seasons of 2003, 2004, and 2005 provide the expert database on local phenology of the major representative crops in each pilot zone needed to backup the system in case of EO missing data. First feedback of users at IAS and farmer level is encouraging.