A multi-disciplinary approach to irrigation management by satellite tools – the MOIST project

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Data from the European Sentinel sensors, part of the Copernicus program, carry a large potential for application in agriculture and water resource management. Now, for the first time, operational data from optical, thermal IR and radar sensors are freely available to users. To fully exploit the potential and to ensure high quality information to the end users is provided, a multi-disciplinary approach is needed.

In MOIST a joint effort by agronomists, remote sensing scientists and IT architects will provide new, scientifically based satellite products to farmers for intelligent irrigation management. MOIST addresses all steps in the value chain, from remote sensing research leading to new, improved satellite products, development of more precise irrigation strategies to the testing and dissemination of the products. A new approach to exploit data from different sensors data will ensure consistency between products, timeliness and high-quality output, and at the same time, overcome some of the limitations of current systems.

MOIST will exploit and combine optical, thermal infrared and SAR data from Sentinel-1, Sentinel-2 and Sentinel-3, each with distinct information content, which enables us to map and update crop water needs in due time before the crop has been damaged by water stress. From satellite data, spatially distributed information about variation within an agricultural field with frequent updates is provided giving timely information to the farmer. The project focuses on algorithms for deriving satellite products crucial for irrigation management: vegetation, water stress, evapotranspiration and soil moisture, based on the fusion of optical, thermal infrared and radar data, and field experiments over selected crops in different climate zones in Denmark, Spain and Italy.