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APPLICATION OF THE ALONG TRACK SCANNING RADIOMETER FOR MONITORING OF SOIL
MOISTURE AND OPTIMISATION OF PLANT WATER SUPPLY

Abstract

It is well known that the crop growth is directly related to evapo-transpiration and the crop yield, is reduced when the soil moisture falls below a threshold value. The application and benefits of the Along Track Scanning Radiometer (ATSR2) on board of ERS2 for agriculture, crop yield, regulation of plant water supply and irrigation is the subject of this study. A two source energy balance model and algorithm to calculate the plant and soil water supply were developed and applied using the multi-spectral observations from the ATSR2. The temperatures and fluxes arising from the component surfaces (soil and plant) have been calculated and the evaporation fraction was used as a measure of plant water supply. The algorithm has been validated and applied, using space observations from the ATSR2. The developed product allows global observations of plant water supply and development of irrigation scheduling program, regulating the applied water and soil moisture by monitoring the evaporation fraction from space. The developed space product has global application and not only predicts the areas of drought, but also helps to develop irrigation scheduling for areas affected by low water supply and regulate when and how much to apply water, maximising irrigation efficiency. It saves water, energy and increases the crop yield by determining the exact amount and timing of water to apply and monitoring the evaporation fraction, using ATSR2 space observations. The product has long term application, using data from the Advanced Along Track Radiometer (AATSR) on board of ENVISAT and future multi-spectral and multi-viewing Earth observing programmes.