Geophysical Research Abstracts
Vol. 18, EGU2016-1133, 2016
EGU General Assembly 2016

Decision Support system- DSS- for irrigation management in greenhouses: a case study in Campania Region

Eugenia Monaco (1), Roberto De Mascellis (1), Maria Riccardi (1), Angelo Basile (1), Guido D'Urso (2), Vincenzo Magliulo (1), and Anna Tedeschi (1)

(1) Institute for Agricultural and Forestry Systems in the Mediterranean - Italian National Research Council , (2) Department of Agriculture Portici (Na), Italy

In Mediterranean Countries the proper management of water resources is important for the preservation of actual production systems. The possibility to manage water resources is possible especially in the greenhouses systems. The challenge to manage the soil in greenhouse farm can be a strategy to maintain both current production systems both soil conservation. In Campania region protected crops (greenhouses and tunnels) have a considerable economic importance both for their extension in terms of surface harvested and also for their production in terms of yields.
Agricultural production in greenhouse is closely related to the micro-climatic condition but also to the physical and agronomic characteristics of the soil-crop system. The protected crops have an high level of technology compare to the other production systems, but the irrigation management is still carried out according to empirical criteria.
The rational management of the production process requires an appropriate control of climatic parameters (temperature, humidity, wind) and agronomical inputs (irrigation, fertilization,). All these factors need to be monitored as well is possible, in order to identify the optimal irrigation schedule. The aim of this work is to implement a Decision Support system -DSS- for irrigation management in greenhouses focused on a smart irrigation control based on observation of the agro-climatic parameters monitored with an advanced wireless sensors network.
The study is conducted in a greenhouse farm of 6 ha located in the district of Salerno were seven plots were cropped with rocket.
Preliminary a study of soils proprieties was conducted in order to identify spatial variability of the soil in the farm. So undisturbed soil samples were collected to define chemical and physical proprieties; moreover soil hydraulic properties were determined for two soils profiles deemed representation of the farm. Then the wireless sensors, installed at different depth in the soils, determined volumetric water content (VWC) by measuring the dielectric constant of the soil using frequency domain technology (FDR).
The data acquired real time were used to determine water balance with a physically based model Hydrus 1D. The results show how the model is able to identify the optimal irrigation schedule as function of soil proprieties and crop needs.

Keywords: irrigation, DSS, rocket, water content