

## **Deepfield connect, an innovative decision support system for crops irrigation management under Mediterranean conditions**

G. De Mastro<sup>1</sup>, G. Vivaldi<sup>1</sup>, S. Camposeo<sup>1</sup>, L. Tedone<sup>1</sup>, M. Berardi<sup>2</sup>, F. Grandolfo<sup>3</sup>, A. Diaferia<sup>3</sup>, A. Sciusco<sup>3</sup>, A. Lastella<sup>3</sup>, A. Arvizzigno<sup>3</sup>, S.A. Alhaji<sup>1</sup>

<sup>1</sup>*Department of Agro-Environmental and Territorial Sciences, University of Bari, Via Giovanni Amendola, 165, Bari, Italy;*

<sup>2</sup>*IRSA-CNR, Viale Francesco de Blasio, 5, Bari, Italy*

<sup>3</sup>*BOSCH, Via delle Ortensie, 19 Zona Industriale, Modugno, Italy*

The irrigation management, in the Mediterranean region, represents an important technique useful to reach sustainable yield and improve the quality of the crop. The use of decision support systems and water saving techniques has gained importance during the last decades mainly in arid and semiarid countries where water is considered a precious resource. DeepField Connect by BOSCH is an innovative tool able to support farmers in irrigation management and consists of three main parts: hardware (sensors, device-to-web-data logger and thermo-hygrometer), algorithm and graphic use interface (app). This system is based on GIS analysis, which represents the most innovative and functional tool for such studies, which provides a mapping of soil hydrological characteristics at the regional level. We used, as a reference, soil data analysis obtained at Regional level from the ACLA II Project. In this way, the system creates an interactive mapping system, matching each point of the Apulian surface, in particular, the texture composition of the soil and the values of the hydrological constants (wilting point, WP and field capacity FC), for irrigation planning. These data are integrated with the recharging point (RP) a value calculated for the main regional irrigated crop which represents the level of soil moisture that, together with FC, represent the range of plant-available water. Besides, this tool provides different irrigation strategies such as deficit irrigation or complete restitution of evapotranspiration losses, according to farmer needs. DeepField Connect by BOSCH transmits the data via the Bosch Cloud to the smartphone. This allows to keep track of fields at any given time and to provide assistance in: when to irrigate and which irrigation volumes to use. This intelligent system can be considered as the application of one of the best practices that the agricultural sector can implement to improve its environmental performance and contribute to sustainable food production.

Keywords: moisture sensors, water use efficiency, water saving, precision agriculture

Corresponding author: F. Grandolfo, francesco.grandolfo@it.bosch.com

(ROSA Ref. n.178)