

Abstract

Sustainable Water Management: Sensors for Precision Farming [†]

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The application of Site Specific Crop Management (SSCM) consists of the knowledge of the variability of soil and yield. In particular, for sustainable water management, it is fundamental to obtain a differentiated response in terms of selective irrigation, analyzing and evaluating the water content of the soil or the water requirement of plants. The innovative contribution of this work lies in designing, developing and validating a technology platform consisting of multi-sensorial hardware for the measurement of parameters characterizing the soil–plant–atmosphere system of intensive crops, i.e., tomato and corn. In order to determine the water content of this system, the two portable sensing units allow to detect gamma-rays emitted from the soil (VIS, BRG and panchromatic, NIR, TIR, range) and to monitor target gases (MOX sensors) related to the crops emissions, such as moisture and VOCs, respectively. The results obtained are compared to reference values defined by the Ground Control Parameters for various types of soil and crops. Finally, in order to improve the variable rate approach of irrigation technologies, georeferenced data obtained are integrated in an experimental computer platform (IRRINET) for the control of water rate and for the creation of an irrigated recipe to interface with the irrigation equipment.



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