



## **Water management of subirrigation using machine learning algorithms**

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Controlling water table depth (WTD) to ensure an optimal soil matric potential (SMP) in the root zone is of primary importance for subirrigation, since WTD and SMP are affected by vertical and lateral leakage from the field and by several other surface hydrological processes. Excessive variation of the WTD may reduce plant transpiration because of either soil saturation or lack of moisture in the root zone. A stochastic model was developed to predict WTD and SMP in the root zone. The model is based on the machine learning algorithms of Random Forest (RF) and Gradient Boosting Machine (GBM). The model predicts, in real-time, hourly WTD and SMP up to a horizon of 24 hours using auto-regressed values of these variables and several meteorological data (rainfall, air temperature, relative humidity, radiation, wind speed). Results of the model application in potato and cranberry fields showed that SMP and WTD can be predicted with good accuracy, which could be of great help for the precision water management of these irrigated crops.