

## **Improving irrigation efficiency in Italian apple orchards: A large-scale approach**

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Nord-Italian region South Tyrol is Europe's largest apple growing area. In order to enable an economically relevant fruit quality and quantity the relative dry climate of the region 450-700mm gets compensated by a large scale irrigation management which until now follows old, traditional rights. Due to ongoing climatic changes and rising public sensitivity toward sustainable usage of water resources, irrigation practices are more and more critically discussed.

In order to establish an objective and quantitative base of information to optimise irrigation practice, 17 existing microclimatic stations were upgraded with soil moisture and soil water potential sensors. As a second information layer a data set of 20,000 soil analyses has been geo-referenced and spatialized using a modern geostatistical method. Finally, to assess whether the zones with shallow aquifer influence soil water availability, data of 70 groundwater depth measuring stations were retrieved.

The preliminary results highlight that in many locations in particular in the valley bottoms irrigation largely exceeds plant water needs because either the shallow aquifer provides sufficient water supply by capillary rise processes into the root zone or irrigation is applied without accounting for the specific soil properties.