



Measuring and Modelling water related soil - vegetation feedbacks in a fallow plot

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Land fallowing is one possible response to shortage of water for irrigation. Leaving the soil unseeded implies a change of the soil functioning that has an impact on the water cycle. The development of a soil crust in the open spaces between the patterns of grass weed affects the soil properties and the field scale water balance. The objective of this study was to test the potential of integrated non invasive geophysics and ground-image analysis and to quantify the effect of the soil vegetation interaction on the water balance of a fallow land at the local and plot scale.

We measured repeatedly in space and time local soil saturation and vegetation cover over two small plots located in southern Sardinia, Italy, during an infiltration experiment. One plot was left unseeded and the other was cultivated. The comparative analysis of the experimental data evidenced a positive feedback between weed growth and infiltration at the fallow plot. A simple bucket model captured the different soil moisture dynamics at the two plots during the infiltration experiment and was used to estimate the impact of the soil vegetation feedback on the yearly water balance at the site.