



Improved soil water balance of compacted soils by deep loosening? – An effectivity assessment with field experiments, discharge monitoring and modelling.

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Compacted soils show decreased infiltration capacities and reduced water retention. A possible solution to meliorate compacted soils in cultivated areas is deep loosening linked with sustainable soil management. To assess the effectivity of this land use measure field experiments and discharge monitoring were realised on a conventional farmed and a deep loosened field with sustainable management practice.

Physical soil data, 2D electrical imaging, infiltration and sprinkling experiments on the plot scale show that deep loosening of compacted soils followed by a sustainable soil management increase infiltration and temporary water retention. The measured discharge at field scale is lower and temporally delayed at the optimised test site.

With the physically based hydrological model CATFLOW simulations on the plot and field scale (30 m² and 4 ha) were accomplished. The model was parameterised with soil physical data measured at both test sites with high spatial resolution. Comparison of model results with the discharge of the sprinkling experiments and the monitored discharge for both fields prove the general applicability of the model to simulate the hydrological effects of land use measures. But there is still a high uncertainty due to measurement methods of soil hydraulic properties and their parameterisation in the model.