



Soil management systems to improve water availability for plants

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Due to climate change it is expected that the air temperature will increase and the amount as well as the variability of rainfall will change drastically within this century. Higher temperatures and fewer rainy days with more extreme events will increase the risk of surface runoff and erosion. This will lead to reduced soil water storage and therefore to a lower water use efficiency of plants. Soil and land management systems need to be applied and adapted to improve the amount of water stored in the soil and to ensure crop productivity functions of soils under changing climatic conditions.

In a 14-yr. long field experiment, the effects of three soil management systems have been studied at three sites in Austria with respect to surface runoff, soil erosion, losses of nutrients and pesticides. Eight years after beginning of the project soil samples have been taken from different depth throughout the root zone to investigate the effects on soil properties.

The results show that soil management systems with reduced tillage intensity are able to improve infiltration and soil water storage. More soil water enables plant development during longer dry periods and decreases amounts of irrigation. Overall, the higher water retention in the landscape improves the regional water balance and reduces environmental problems like soil erosion and nutrient and pesticide losses