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Drought soil legacies and grassland responses to subsequent drought

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Droughts are affecting ecosystems worldwide and are expected to become increasingly frequent and intense in the near future. While the detrimental impacts of droughts on terrestrial ecosystems are well documented, it is largely unknown whether and how drought effects on soils can alter ecosystem responses to subsequent drought. We will present several case studies which demonstrate that drought effects on soil microbial communities not only affect soil functioning in response to recurrent drought, but can also have legacy effects on grassland productivity and how it is affected by subsequent drought. Furthermore, we will showcase recent advances in testing for drought legacy effects on soil properties related to plant water availability, highlighting that scenarios of frequent and more intense drought can lead to reduced plant water access even following rain events and during subsequent dry periods. Our findings suggest that drought soil legacies induced by repeated and / or severe drought can have major implications for the functioning of grassland ecosystems and their response to subsequent drought.