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Response of soil moisture to rainfall reduction under different grassland species: preliminary results of a rainfall exclusion experiment under a Mediterranean climate

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Permanent grassland (PG) covers about 30% of the cultivated area of Europe, and 5 x 10^8 ha of them are in the Mediterranean zones. Climate change and prolonged drought seasons can expose PG's soils to bare conditions for a long time, raising the land degradation risk, and diminishing food delivery to cattle. The objective of this study is to measure the response of soil moisture to a reduction in rainfall in different grass species. A rainfall exclusion experiment was set up to intercept 30% of the natural rainfall in Cordoba, Spain. Soil moisture was measured in 18 plots of 2 m^2, of which 9 were under exclusion and 9 under natural rainfall. We used a Drill and Drop Sentek soil moisture probe, measuring between 0 – 30 cm depth, from 1/11/21 until 27/01/22. We also measured phenological plant response. Average soil moisture was clearly lower in the reduced rainfall plots. These results will contribute to understand the effect of future climate on soil moisture, grass response and agricultural food security in the region. In particular, it will help farmers to select the species that best resist drought conditions.