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Manure and crop rotation affect water retention under dry conditions in long term experiments

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Crop rotation and manure application are agricultural practices that are regularly used to improve soil quality and crop yields, and long term experiments (LTEs) provide an excellent platform to assess their impact. There is a large volume of literature on the benefits of these practices on soil structure, organic matter contents, soil nutrient levels, and other soil chemical properties. There is, however, little to no information on the impact of manure application and crop rotation on water retention at low matric potentials ($pF > 5.0$; < -10 MPa) as occurs under dry conditions. The study utilizes LTEs (20 to 127 years) from Denmark, Sweden, Germany, Spain and the UK that includes manure application and various crop rotation sequences. The sites vary in soil texture, organic matter content, and manuring rates. We measured water vapour adsorption and desorption isotherms covering the range from -10 MPa to -465 MPa (pF 5.0 to 6.8) on soil samples from the LTEs. The presentation will discuss the interactive effect of soil texture, manure and crop rotation on the magnitude of water sorption, its hysteresis, and the specific surface area.