

Soil water repellency in long term drought and warming experiments

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Increased global temperatures, altered rainfall patterns and frequently occurring extreme climatic events are already observed globally as a result of the climatic changes and further increases are predicted by the climatic models. Extreme weather events such as prolonged dry spells and heat waves can significantly affect soil ecosystem functions mainly due to decrease in soil moisture. Several studies suggested an increase in soil water repellency severity and spread as a consequence of the warming and drought, however, such understanding is based on the laboratory experimentations with soil treated as a 'black box'.

In this study we tested the hypothesis of increased severity of soil water repellency subjected to drought and warming under field conditions. Occurrence and severity of soil water repellency was tested in soils subjected to a long-term (10 years) climatic simulation at two upland heathland sites in Oldebroek (Netherlands) and in Clocaenog (UK)[1]. Soil plots with similar vegetation were subjected to repeated drought and warming, compared with the control plots. Drought effect was created by a rainfall exclusion using an automatic self-retracting waterproof curtains while the warming effect was made by using a self-retracting curtains reflecting infrared radiation overnight.

The results available to date provide a strong indication that climatic conditions do affect the development of SWR.