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The influence of organic soils moisture content on water repellence

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Water repellency has been reported to occur under a wide variety of soil and climatological conditions. Soil wettability depends on several factors, which are principally related to the characteristics of the organic matter of the soil. Water repellent soils display properties with a consequent reduction in infiltration, which may cause accelerated runoff and erosion and reduce plant establishment and growth. Another effect of water repellency of soil is considerable variation in soil water content and irregular moisture patterns. Water repellency of soils depends also on actual moisture content. This effect was observed in several water-repellent mineral soils, but there is only a few of such research performed on peat soils. The main objective of this paper is to determine the influence of moisture content of peat and gyttja material on water repellence. The severity of water repellency was determined using water drop penetration time test. The water drop penetration time method simply consists of placing a water drop on the soil surface and recording the time take for the water to penetrate the sample. The test was performed for several undisturbed soil samples for different peat and gyttja as well as for different moisture content. From the obtained results it can be concluded that water drop penetration time is very sensitive to soil water content changes. All considered soil horizons represent the range bounded by almost non-repellence at saturated soil moisture content and a rapidly increasing repellence with decreasing water content. In the case of peat layer the peak in water drop penetration time function of soil water content was observed.