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# Effect of calcite and thermal energy input on the persistence of soil water repellency

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The effects of adding 1 and 15% (weight) calcite, as well as thermal energy input on the wettability of water-repellent sandy soil sampled near Sekule (southwest Slovakia) were studied both with and without the wetting and drying cycle before the heating phase. The persistence of water repellency was estimated with the water drop penetration time (WDPT) test. After wetting, water repellency disappeared in all the samples. During the drying phase, water repellency re-appeared in all samples (untreated and calcite-treated) as the water content decreased below 1%. Repellency did, however, not reach pre-wetting levels. The effect of calcite addition on water repellency depended on the amount of calcite addition. An addition of 1% and 15% calcite resulted in 68% and 97% decrease in WDPT, respectively, in the treatment without the wetting and drying cycle before the heating at 50˚C. The effect of heat on water repellency was estimated on the samples both with and without calcite addition at the temperatures of 50, 100, 150, 200, 250, and 300˚C. The heating at 50˚C was used to simulate the effects of hot dry spells on water repellency. The heating at 100, 150, 200, 250, and 300˚C was used to simulate the heating effect that accompanies the passage of a grass, shrub, and forest fire on soil water repellency. The heating at 150, 200, and 250˚C resulted in an increase in the persistence of water repellency in all the samples. Destruction of water repellency occurred in the samples heated at 300˚C where the temperature induced a decomposition of hydrophobic substances.