



Soil water balance in Retisol derived from silty deposits of Carpathians

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Retisols derived from silty deposits dominate in the soil cover of the Carpathian Foothills in Poland. The hydrophysical properties of these soils are determined by the grain-size distribution of the parent material and the soils' "primary" properties shaped in the deposition process. The other contributing factors are the soil-forming processes, such as leaching (leaching of clay particles), and the morphogenetic processes that presently shape the relief. These factors are responsible for the "secondary" differentiation of hydrophysical properties across the soil profile. Both the primary and secondary hydrophysical properties of soils (the rates of water retention, filtration and infiltration, and the moisture distribution over the soil profile) determine their ability to take in rainfall, the amount of rainwater taken in, and the ways of its redistribution. All of them together with climate condition: amount of precipitation, wind, temperature and solar radiation and plant cover have influence on soil water balance

The aim of the study, carried out during 2015-2016, was to investigate the soil water balance in Retisol derived from silty deposits located on opposite exhibition – north and south.

Soil moisture data were measured using 5TM moisture and temperature sensor and collected by logger Em50 (Decagon Devices USA). Data were captured every 10 minutes from 6 sensors at depths: - 10 cm, 20 cm, 40 cm, 60 cm and 80 cm. Meteorological data came from meteorological station situated 50 m away from the soil profile.

Water balance of the Retisols during vegetation season was negative. The monthly soil water balance vary from month to month, however, positive values of water balance may be present, and was connected with the amount and distribution of precipitation. The water balance of the soils has positive values from March to April due to water accumulation during the winter season, and low evapotranspiration. In the summer and autumn months, the water balance may have positive values on several days in a row. This happens mainly during the periods of continuous heavy rainfall, or in cases, when the total precipitation of a given month exceeds its long-term average.

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