



Bowen ratio measurements above various vegetation covers and its comparison with actual evapotranspiration estimated by SoilClim model

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The principle of Bowen ratio is one of the available techniques for measurements of actual evapotranspiration (ET_a) as one of essential water balance fractions. The main aims of submitted study were: (i) to compare the water balance of selected crops, (ii) to compare outputs of SoilClim model with observed parameters (including ET_a on Bowen ratio basis). The measurements were conducted at two experimental stations in the Czech Republic (Polkovice 49°23' (N), 17°17' (E), 205 m a.s.l.; Domanínek 49°32' (N), 16°15' (E), 544 m a.s.l.) during the years 2009 and 2010. Together with Bowen ratio the global solar radiation, radiation balance, soil heat flux, volumetric soil moisture and temperature within selected depths, precipitation and wind speed were measured. The measurements were conducted simultaneously above various covers within the same soil conditions: spring barley vs. winter wheat, spring barley vs. winter rape; grass vs. poplars; harvested field after tillage vs. harvested field after cereals without any tillage. The observed parameters from different covers were compared with SoilClim estimates. SoilClim model is modular software for water balance and soil temperature modelling and finally could be used for soil Hydric and Thermic regimes (according to USDA classification) identification. The core of SoilClim is based on modified FAO Penman-Monteith methodology.

Submitted study proved the applicability of SoilClim model for ET_a, soil moisture within two defined layers and soil temperature (in 0.5 m depth) estimates for various crops, covers, selected soil types and climatic conditions.

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