The first part of the paper analyses the dynamics of forest soils moisture regime in the 2nd to the 5th vegetation zone, in the depth of 30 cm on the transect Hronská Dúbrava – Mláčik. *Fageto-Quercetum* (FQ), *Fagetum pauper* (Fp), *Fagetum typicum* (Ft) and *Fageto-Aceretum* (FAc) (by Zlatník) represent altitudinal zones. The research was conducted in the years 2004–2007. We present in the paper results of intensive desiccation in the 2nd vegetation zone, as well as differences between vegetation zones and forest type groups. We analysed statistically soil moisture variability between spring and summer months within one community, as well as between vegetation zones and forest group types.

The second part presents analysis of annual and seasonal trend of forest soils moisture during the four analysed years. Decreasing trend was statistically evaluated.

The third part brings discussion on expected climate change impacts on soil moisture regime according to several authors. Our recent finding from the model region complements this overview.

**Key words:** soil moisture, soil drying up, altitudinal vegetation zone