



Thermal and water regime of green roof segments filled with Technosol

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Artificial soil systems and structures comprise appreciable part of the urban areas and are considered to be perspective for number of reasons. One of the most important lies in contribution of green roofs and facades to the heat island effect mitigation, air quality improvement, storm water reduction, etc. The aim of the presented study is to evaluate thermal and water regime of the anthropogenic soil systems during the first months of the construction life cycle.

Green roof test segments filled with two different anthropogenic soils were built to investigate the benefits of such systems in the temperate climate. Temperature and water balance measurements complemented with meteorological observations and knowledge of physical properties of the soil substrates provided basis for detailed analysis of thermal and hydrological regime. Water balance of green roof segments was calculated for available vegetation seasons and individual rainfall events. On the basis of an analysis of individual rainfall events rainfall-runoff dependency was found for green roof segments. The difference between measured actual evapotranspiration and calculated potential evapotranspiration was discussed on period with contrasting conditions in terms of the moisture stress. Thermal characteristics of soil substrates resulted in highly contrasting diurnal variation of soils temperatures.

Green roof systems under study were able to reduce heat load of the roof construction when comparing with a concrete roof construction. Similarly, received rainfall was significantly reduced. The extent of the rainfall reduction mainly depends on soil, vegetation status and experienced weather patterns.

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