Estimation of the Water Evaporation Intercepted by an Adult Plantation of *Eucalyptus globulus* in Uruguay

Alonso J*[1], Silveira L[1]

[1]*Department of Hydrology, Institute of Fluid Mechanics and Environmental Engineering, Universidad de la República, Montevideo, Uruguay.*
E-mail: jalonso@fing.edu.uy

Abstract

The interception of rainfall by vegetation cover is one of the main components of the water balance in forest systems. Forest usually have an increased evaporation of water from the canopy compared to short vegetation or annual crops, in the local conditions of wet climate this is mainly due to the high rate of evaporation from the wet canopy (interception) given by a greater storage capacity and the increased aerodynamic roughness of forests. According to results of the monitoring program on forest plantations carried out by the Universidad de la República, interception loss represents between 20 and 30% of the daily incident rainfall of medium events (40-20 mm/day), and between 10 and 18% of the daily incident rainfall of extreme events (90-60 mm/day). Rainfall interception modelling, based on the rainfall redistribution process in forest plantations, is very sensitive to the estimation of the evaporation of water retained in the canopy and thus, to the estimation of the aerodynamic resistance. In most interception models the aerodynamic resistance is determined from the roughness length for momentum transfer; Lankreijer *et al.* (1993) suggest a more general formulation considering heat transfer.
In this study the Gash interception model was implemented with the objective to analyse the model sensitivity to the roughness length for momentum and heat transfer. The modified version of Gash model was calibrated and validated using field measures of interception from a Eucaliptus globulus experimental plot located in the northwestern region of Uruguay. The simulation period was from August 2006 to April 2014. Over 400 rainfall events with complete meteorological measurements were compared with the simulated values. The results show improvements of the interception model by the introduction of the general formulation tested, which is considered most appropriate in the local climate conditions.

Keywords: evapotranspiration, rainfall interception, Eucalyptus forest