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Rainfall interception in Abies fabri forest with different-aged stands and its influence on SWC in Southwest China

Sun Xiangyang (1), Wang Genxu (1), and Wu Yong (2)

(1) Institute of Mountain Hazards and Environment, Chinese Academy of Sciences, Chengdu, China (sunxiangyang03@126.com), (2) Chengdu University of Technology, Chengdu, China (groundwaterwu@163.com)

Interception is one of the most important hydrological processes. Most investigations merely focus on canopy interception, but forest litter interception should also be considered. The stand age also influences interception. To explore the interception characteristics of *Abies fabri* with different stand ages, canopy, stem, and forest litter interceptions were evaluated during the rainy season of 2009 (from May to October 2009). Spatial pattern of soil water content (SWC) was also investigated to derive the canopy interception effect. Mature stand had largest canopy interception ratios and lowest forest litter interception ratios. Young stand had large canopy and forest floor interception ratio than middle-aged stand. We concluded that the differences among the interceptions of the forest stands were correlated with the leaf area index. A higher stand height also reduced the rate of forest litter evaporation. The water-storage capacities of the young, middle-aged, and mature forest stands were 8.22, 7.61, and 10.78 mm, respectively. Due to lower temperature, the forest litter had large amount and low decomposing rate. The decomposing degree also had significant influence on water storage capacity of forest litter. SWC showed spatial variation significantly, which was relative to the canopy structure. The mature stand with larger canopy interception rate had larger SWC than young and middle-aged, both leaf area index and soil texture may play significant role in determining SWC. The SWC inside the forest was larger than that outside, net radiation and evaporation rate may contribute to this phenomenon. These results implied that the canopy and forest floor interceptions were related to the forest water balance, and that accurate estimates of the interception of different-aged forest stands were crucial in evaluating the role of a forest in the hydrological cycle.

Keywords: Interception, stand age, soil water content, spatial pattern, Mt Gongga