

The effect of surface cover on infiltration rate in devastated Hinoki plantations

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The Japanese cypress (Hinoki; *Chamaecyparis obtusa*) is a major commercial tree species in Japan, and without thinning of high-density stands, canopy closure prevents development of understory vegetation. Therefore there is a concern for overland-flow and sediment yield due to infiltration rate lowering from steep hillslopes of Japanese cypress plantation. We developed a light-weight rainfall simulator based on the design of Meyer and Harmon (1979). A flat fan Veejet 80150 spraying nozzle (Spraying systems Co., USA) is mounted on the manifold at 2.13 m high from the plot surface. The nozzle oscillates so that the spray fans swept across the targeting 1m x 1m plot. The Veejet 80150 spraying nozzle produces large raindrops larger than 2 mm in diameter, and can simulate the high raindrop kinetic energy of natural storm. A targeted rainfall rate is 180 mm/h. Total 25 sprinkling experiments have been conducted on 35-degree hillslopes with varying surface cover. We obtained the minimum infiltration rate of 14 mm/h where the surface cover is very little. The infiltration rates were plotted against the total understory vegetation and dry weight of total surface cover including litter. The infiltration rate increased with the increasing total surface cover, and higher regression coefficient is obtained for the case of the total surface cover. These results will contribute to the future modeling studies of overlandflow occurrences for the catchment scales.