

Water and solute dynamics in soils under different environments

KOBAYASHI, Masahiro^{1*}, S. Yoshinaga², Y. Itoh¹

¹Forestry and Forest Products Research Institute, ²Kyushu Reserach Center, Forestry and Forest Products Research Institute

The water and solute flux in soils was measured at lower slopes and upper slopes in the Katsura experimental forest (KEF) and the Tsukuba experimental forest (TEF), both located in Ibaraki, Japan. The soil water flux was around 300 mm less than throughfall at the upper slopes and exceeded the throughfall at the lower slopes and the same level at the lower slopes. The percentage of the flux of nitrate-N to inorganic-N below litter layer was about 70 at the upper slope and larger than 90 at the lower slopes, reflecting high nitrification rate in moist conditions. The nitrogen deposition by throughfall was less than 10 kg ha⁻¹ y⁻¹ in KEF and was near 20 kg ha⁻¹ y⁻¹ in TEF. The nitrate-N flux at 100 cm depth was almost zero at KEF and exceeded 40 kg ha⁻¹ y⁻¹ at TEF. In TEF, the nitrogen input is thought to exceed the ecological demand. High nitrate concentration in TEF soil caused leaching of Ca and mobilization of Al.

Keywords: Forest soil, water, solute, site environment