

Soil water, overland flow and spring flow in a pasture watershed

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To well-maintain a sloping pasture without severe erosion and nitrate outflow it is necessary to clarify the hydrological processes in a watershed and examine some conservative guidelines within the drainage system. An experimental small watershed largely occupied by pasture was selected at the foot of Mt. Asama. We measured the variation of soil water at landforms such as ridge, middle slope and valley bottom in the watershed and also monitored the runoff water in the valley bottom. We found that the overland flow selectively occurs at the valley bottom with a drainage area of 10 to 30 ha. The minimum rainfall intensity for the occurrence of overland flow was 3mm/5min or 35mm/60min. This rainfall intensity was relatively smaller than the infiltration capacity of surface soil. At the rainfall condition subsurface flow appeared at the upper part of surface-soil in the valley bottom and formed overland flow at a steeper section of valley bottom. Below the rainfall intensity most of rainwater infiltrated into soil and partly formed a spring flow at the lower end of watershed.