EFFECT OF HARD PAN ON SOIL WATER FLOW WITH RICE-RICE CROPPING SYSTEMS IN NONCALCIC BROWN SOILS.

V.S. Ratnayake and Ranjith B. Mapa,
Faculty of Agriculture, University of Peradeniya.

When soils are ploughed at the same depth and puddled for lowland rice cultivation it forms a hard pan which may be beneficial for paddy cultivation in coarse textured soils. This will impede deep percolation of water and increase water use efficiency for paddy cultivation but may cause soil aeration and rot penetration problems for highland crops. The objective of this study was to evaluate the effects of hardpan formation on soil water flow in a rice-rice cropping systems with contrast to uncultivated conditions in Noncalcic Brown soils (Haplustalfs).

This study was conducted at the Mahaweli System "B" at the Regional Agricultural Research Centre, Aralaganwila, in the Galnewa Series of Noncalcic Brown (NCB) soils. An uncluti vated site and a site where rice-rice cropping system has been practiced for six continuous years in close proximity were selected as experimental sites. Steady infiltration rate, saturated hydraulic conductivity (Ks), bulk density, soil strength and the clay migration in the soil profile were characterized in both sites.

Clay content, bulk density and soil strength were higher in the lower depths in the cultivated site showing development of a hard pan with contrast to the uncultivated field. The mean infiltration rate of the uncultivated site was 3.35 cm/h which reduced to 0.37 cm/h in the cultivated plots. Mean Ks of the cultivated site 3.80 cm/h when compared to 14.24 cm/h in the uncultivated site.