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Development of HARD PAN in low- land rice fields of Polonnaruwa district

Plowing repeatedly at the same depth and puddling forms a hard pan, which increases water, use efficiency in paddy cultivation. As land preparation is becoming expensive many farmers are used to plough at shallow depths than before causing hard pan development at shallower depths. Formation of a shallow hard pan decreases the effective rooting depth and is attributed as a major reason for yield stagnation of rice in Polonnaruwa district.

The objective of this study was to characterize soil physical properties in soil profiles where lowland rice was grown for many years in Pollonnaruwa district to observe the depth of hard pan formation. The penetromete resistence, clay content, soil bulk density and saturated hydraulic conductivity were measured with dept in well and imperfectly, drained Reddish Brown Earth soils (RBE), and Low Humic Gley soils at Bediwewa, Minnariya and Giritale. The penitrometer readings showed the development of hard pans around 15 to 17 cm in all sites.

The clay content increased from surface to the hard pan from 10% to aboput 21% in most sites. The bulk density increased from 1.6 to 1.8 g/ cm^3 while the saturated hydraulic

conductivity also deceased. The results showed that the depth of hard pan should be determined before advising the farms to deep plough their paddy fields.