

## **Bulk Soil Properties as Determinants of the Soil Compression Strength of Puddled Lowland Paddy Soils in Sri Lanka**

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**ABSTRACT:** *Soil strength/penetration resistance of lowland puddled soil is an important parameter for designing farm machinery. This study was aimed to estimate the overall penetration resistance of lowland puddled soils through the assessment of bulk soil parameters. Penetration resistance and bulk soil parameters including moisture content, bulk density, particle density, porosity, texture and organic matter content were measured under real field condition and evaluated to identify the suitable determinants to explain the variation of soil penetration resistance and their relationships. Results revealed that measured penetration resistance by Eijkelkamp hand penetrometer and bulk soil parameters except particle density, notably varied with weed controlling methods, depth of the soil and the time. Penetration resistance showed a significant relationship with Bulk density (BD), moisture content (MC) and porosity (PO) at .05  $\alpha$  level as  $4017.87 - 44.72MC - 1669.83BD$ ,  $2115.65 - 44.18PO$  and  $3383.78 - 58.09PO$  in 0 – 10 cm, 10 – 20 cm and 20 – 30 cm depths, respectively.*

**Keyword:** *Bulk soil parameters, penetration resistance, soil strength, weed controlling methods*

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