

THICK SAND OVER POORLY STRUCTURED CLAY

General Description: *Delved thick sand with a bleached subsurface layer over a coarsely structured brown clay, calcareous with depth.*

Landform: Gently undulating plains.

Substrate: Tertiary age sandy clay.

Vegetation:



Type Site:	Site No.:	SE127	1:50,000 mapsheet:	7025-4 (Cannawigara)
	Hundred:	Pendleton	Easting:	455600
	Section:	41	Northing:	5995940
	Sampling date:	31/10/06	Annual rainfall:	490 mm average

Flat on very gently undulating plain with low sand rises. Soft surface with no stones. Paddock delved to 45 cm.

Soil Description:

<i>Depth (cm)</i>	<i>Description</i>
0-13	Very dark greyish brown friable loamy sand. Delved clay fragments common. Abundant roots. Clear to:
13-20	Dark greyish brown friable single grain water repellent light loamy sand. Many roots. Clear to:
20-38	Very pale brown (bleached) friable single grain sand. Roots common. Sharp to:
38-80	Brownish yellow, brown and red mottled very hard medium clay with very coarse columnar, breaking to medium angular blocky, structure and grey mottles on column faces. Roots few to common. Diffuse to:
13-45	Delved zone - mix of upper three horizons. Roots common.
80-100	Light yellowish brown hard light medium clay with very coarse prismatic, breaking to coarse angular blocky, structure. Roots few to common. Gradual to:
100-120	Light yellowish brown hard light clay with weak medium subangular blocky structure and 20-50% carbonate veins. No roots.



Classification: Calcic, Mottled-Mesonatric, Yellow Sodosol; thick, non-gravelly, sandy / clayey, deep



Summary of Properties

- Drainage:** Moderately well to imperfectly drained. Water is likely to perch on top of the clay subsoil for a week to several weeks following heavy or prolonged rainfall.
- Fertility:** Inherent fertility is low, as indicated by the exchangeable cation data. The bleached subsurface layer 20-38 cm is a major limitation to root growth due to very low nutrient retention capacities. Delving has improved cation status of this layer (compare original subsurface layers 13-38 cm with delved sand layer 13-45 cm). Surface soil test data indicate that trace elements (copper, zinc and manganese) may all be deficient, but tissue testing needed for confirmation. Concentrations of tested macronutrient elements are satisfactory.
- pH:** Acidic at the surface, alkaline in the subsoil, and strongly alkaline at depth.
- Rooting depth:** 80 cm in sampling pit, with a few roots extending to 100 cm.
- Barriers to root growth:**
- Physical:** The coarsely structured clay subsoil restricts root growth, confining most roots to aggregate surfaces. Delving has helped by disrupting the topsoil – subsoil barrier.
 - Chemical:** Very low subsurface nutrient retention capacity is the main limitation.
- Waterholding capacity:** Approximately 90 mm total available water in the potential rootzone.
- Seedling emergence:** Fair to satisfactory, depending on the degree of water repellence. Delving has reduced repellence, although subsurface still affected.
- Workability:** Satisfactory. Sandy surface soils are easily worked.
- Erosion Potential:**
- Water:** Low.
 - Wind:** Moderately low.

Laboratory Data

Depth cm	pH H ₂ O	pH CaCl ₂	CO ₃ %	EC1:5 dS/m	ECe dS/m	Cl mg/kg	Org.C %	NO ₃ + NH ₄ mg/kg	Avail. P mg/kg	Avail. K mg/kg	SO ₄ -S mg/kg	React Fe mg/kg	Ext Al mg/kg	Boron mg/kg	Trace Elements mg/kg (EDTA)				Sum cations cmol (+)/kg	Exchangeable Cations cmol(+)/kg				Est. ESP
															Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
0-13	6.0	4.9	0	0.08	0.67	23	1.73	22	43	237	10	584	1	0.6	0.48	167	5.69	1.32	5.5	3.80	0.89	0.20	0.61	3.6
13-20	5.5	4.6	0	0.07	0.56	37	1.45	6	43	41	8.4	488	4.2	0.5	0.73	236	5.06	1.36	3.2	2.36	0.46	0.25	0.11	7.7
20-38	6.7	5.8	0	0.03	0.25	9	0.28	3	23	31	2.0	313	0	0.2	0.16	123	1.13	0.23	1.5	1.06	0.23	0.17	0.07	na
38-80	8.3	7.2	0	0.18	1.30	52	0.43	7	2	389	7.3	612	0	3.8	0.46	40	2.29	0.28	21.4	6.54	10.2	3.55	1.12	16.6
80-100	9.4	8.4	0	0.30	1.15	60	0.17	7	2	359	14.1	469	0	5.3	0.43	28	8.91	0.30	20.7	6.39	8.6	4.70	0.97	22.7
100-120	9.6	8.6	10	0.44	1.19	84	0.20	6	2	377	20.1	486	0	6.3	0.23	11	2.37	0.21	22.7	8.46	7.7	5.49	1.05	24.2
13-45 *	7.1	6.1	0	0.14	0.81	44	0.84	12	10	369	9.0	1051	0	2.2	0.82	109	3.29	1.37	14.2	5.53	5.99	1.61	1.09	11.3
13-45 **	6.3	5.2	0	0.06	0.44	17	0.99	8	35	49	4.2	589	2.1	0.4	1.11	220	2.92	0.94	3.8	2.76	0.59	0.27	0.14	7.1

Note: Sum of cations, in a neutral to alkaline soil, approximates the CEC (cation exchange capacity), a measure of the soil's capacity to store and release major nutrient elements.

ESP (exchangeable sodium percentage) is derived by dividing the exchangeable sodium value by the CEC, in this case estimated by the sum of cations.

* Clay lumps sampled from within the zone altered by delving.

** Sand sampled from within the zone altered by delving.

Further information: [DEWNR Soil and Land Program](#)

