

SANDY CLAY LOAM OVER RED CLAY ON KAOLINITIC ROCK

General Description: *Hard sandy loam to sandy clay loam over a coarsely structured red clay, calcareous with depth, forming in kaolinised highly weathered sandstone*

Landform: Gently undulating rises.

Substrate: Highly weathered and kaolinised basement sandstone, mantled by soft windblown carbonates.

Vegetation:



Type Site:	Site No.:	CU074	1:50,000 mapsheet:	6532-3 (Melrose)
	Hundred:	Wongyarra	Easting:	239850
	Section:	28	Northing:	6357750
	Sampling date:	13/02/2013	Annual rainfall:	465 mm average

Upper slope of undulating rise, 3% slope. Hard setting surface, with 2-10% quartz gravel.

Soil Description:

<i>Depth (cm)</i>	<i>Description</i>
0-18	Dark brown hard sandy clay loam with weak granular structure. Abrupt to:
18-40	Dark reddish brown hard medium clay with strong coarse angular blocky structure. Clear to:
40-90	Pinkish grey massive hard very highly calcareous (and kaolinitic?) medium clay with 50-90% fragments of coarse sandstone to 20 mm. Diffuse to:
90-160	White massive hard highly calcareous light medium clay – kaolinitic highly weathered sandstone.



Classification: Sodic, Calcic, Red Chromosol; medium, non- gravelly, clay loamy / clayey, deep



Summary of Properties

- Drainage:** Moderately well drained. The deep subsoil is sodic, and will restrict downward movement of water to some extent. Saturation of the lower part of the profile is possible for a week or so following heavy or prolonged rainfall.
- Fertility:** Inherent fertility is moderate, as indicated by the exchangeable cation data. There is reasonable nutrient retention capacity in the surface soil (largely attributable to the high organic carbon level), but kaolinitic clays have restricted capacity (note decrease in sum of cations from 40 cm depth). There are no apparent nutrient deficiencies. Organic carbon levels are very high for this soil type / rainfall zone.
- pH:** Acidic at the surface, strongly alkaline with depth.
- Rooting depth:** 60 cm, with some roots persisting to 70 cm.
- Barriers to root growth:**
- Physical:** High clay strength limits root proliferation.
 - Chemical:** Elevated pH, sodicity and salinity limit root growth.
- Waterholding capacity:** Approximately 60 mm in potential rootzone.
- Seedling emergence:** The surface sets hard and seals when dry, affecting emerging seedlings in unfavourable weather conditions.
- Workability:** The surface soil tends to shatter if worked too dry, and puddle if worked too wet, so there is a limited moisture range for effective working.
- Erosion Potential**
- Water:** Moderately low. Soil is erodible, but slope is gentle.
 - Wind:** Low.

Laboratory Data

Depth cm	pH H ₂ O	pH CaCl ₂	CO ₃ %	EC 1:5 dS/m	ECe dS/m	Org.C %	NO ₃ mg/kg	Avail. P mg/kg	Avail. K mg/kg	SO ₄ -S mg/kg	Boron mg/kg	Trace Elements mg/kg (DTPA)				Sum cations cmol (+)/kg	Exchangeable Cations cmol(+)/kg				Est. ESP
												Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
Paddock	5.5	4.7	0	0.146	0.99	2.88	14	53	520	19.9	1.1	0.72	66	32.5	3.28	11.9	8.30	2.19	0.21	1.23	1.8
0-18	5.8	4.9	0	0.135	0.95	2.67	12	30	509	17.5	1.2	0.75	61	23.7	2.48	13.6	9.79	2.23	0.24	1.29	1.8
18-40	8.1	7.3	0.7	0.154	0.77	1.13	3	10	310	4.6	1.5	0.70	11	6.18	0.23	21.5	16.2	4.21	0.27	0.80	1.3
40-90	9.6	8.6	13.5	0.687	5.34	0.24	6	21	171	95.3	4.5	0.25	2	0.62	0.08	12.9	5.34	4.17	3.20	0.17	24.8
90-160	9.6	8.9	1.2	1.226	11.5	0.12	24	4	76	145	4.2	0.15	2	0.68	0.18	11.3	2.43	2.24	6.38	0.20	56.7

Note: Paddock sample bulked from cores (0-10 cm) taken around the pit.

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.

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

