

HARD LOAM OVER DISPERSIVE RED CLAY

General Description: *Hard setting reddish brown sandy loam to clay loam overlying a strongly structured dark reddish brown clayey subsoil with soft calcareous segregations at depth, forming in fine grained alluvium*

Landform: Lower slopes and valley flats

Substrate: Fine grained alluvium, mantled by soft secondary carbonates, of the Pooraka Formation

Vegetation: Open savannah with scattered blue gum, red gum, sheoak and irongrass



Type Site:	Site No.:	CU025	1:50,000 mapsheet:	6631-3 (Bundaleer)
	Hundred:	Belalie	Easting:	283450
	Section:	536	Northing:	6317250
	Sampling date:	25/02/1993	Annual rainfall:	455 mm average

Mid slope of a broad alluvial fan. Hard setting surface. 2% slope.

Soil Description:

Depth (cm)	Description
0-20	Yellowish red very hard massive light clay loam. Abrupt change to:
20-40	Dark reddish brown very hard medium heavy clay with strong coarse prismatic structure. Gradual change to:
40-65	Dark reddish brown very hard medium heavy clay with strong blocky structure. Clear change to:
65-95	Red friable highly calcareous medium clay with moderate blocky structure and 2-10% soft carbonate segregations. Gradual change to:
95-120	Dark red and orange very hard massive clay loam (buried soil surface). Abrupt change to:
120-150	Dark red firm medium clay with strong prismatic structure (buried subsoil).



Classification: Calcic, Subnatric, Red Sodosol; medium, non-gravelly, loamy / clayey, moderate

Summary of Properties

- Drainage:** Moderately well to imperfectly drained due to the soil's hard setting, sealing surface and its slowly permeable sodic clay subsoil. The soil may remain wet for one to several weeks after rain.
- Fertility:** Inherent fertility is moderate to high, as indicated by the exchangeable cation data. Organic matter (low at the type site) is necessary to maintain surface fertility. There is ample surface phosphorus (high values in the lower layers indicate a buried soil).
- pH:** Slightly acidic at the surface, grading to alkaline with depth.
- Rooting depth:** 120 cm in pit, but few roots below 95 cm.
- Barriers to root growth:**
- Physical:** Hard clay subsoil (caused high exchangeable sodium).
 - Chemical:** Class I carbonate layer from 65 cm restricts root development. Low zinc from 20 cm may also be limiting.
- Waterholding capacity:** 140 mm in rootzone (high), but not all is available because of low root densities.
- Seedling emergence:** Fair to poor due to hard setting surface, which tends to seal over. This condition is made worse by low organic matter levels. Gypsum response is highly likely.
- Workability:** Fair to poor due to the poor structure of the surface. The soil has only a narrow moisture range for safe cultivation, outside of which shattering or puddling occurs. Improved organic matter status and gypsum will improve workability.
- Erosion Potential:**
- Water:** Moderately low due to the low slope. However the soil is highly erodible and on sloping ground erosion potential would be significant.
 - Wind:** Low, unless the soil is excessively cultivated or over-grazed.

Laboratory Data

Depth cm	pH H ₂ O	pH CaCl ₂	CO ₃ %	EC1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	SO ₄ mg/kg	Boron mg/kg	Trace Elements mg/kg (DTPA)				CEC cmol (+)/kg	Exchangeable Cations cmol(+)/kg				ESP
											Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
Paddock	5.7	5.2	0	0.06	0.41	1.2	54	1003	-	1.0	1.3	43	58.9	0.6	7.4	3.81	1.52	0.14	0.72	1.9
0-20	6.1	5.4	0	0.04	0.20	0.7	39	1117	-	1.0	1.4	19	34.9	0.3	6.7	3.43	1.75	0.26	0.45	3.9
20-40	8.0	7.0	0	0.12	0.30	0.8	7	1110	-	7.5	2.1	9	8.1	0.1	24.6	6.33	10.79	3.30	1.19	13.4
40-65	8.7	7.9	0.2	0.21	0.63	0.4	7	562	-	12.6	1.6	7	4.7	0.1	22.3	5.22	11.36	3.80	1.21	17.0
65-95	9.0	8.3	4.9	0.64	4.08	0.1	9	824	-	6.2	0.8	6	2.4	0.2	15.3	3.94	7.85	3.87	0.79	25.3
95-120	8.9	8.4	0.3	0.51	4.10	0.1	12	921	-	3.4	0.6	4	2.8	0.2	8.7	2.49	4.40	2.22	0.40	25.5
120-150	8.3	7.8	0.1	0.94	4.46	0.2	23	602	-	11.0	1.2	6	2.3	0.1	29.7	6.19	15.61	8.11	1.59	27.3

- Note:** Paddock sample bulked from cores (0-10 cm) taken around the pit.
CEC (cation exchange capacity) is 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.

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

