COARSELY STRUCTURED GRADATIONAL RED CLAY LOAM

General Description: *Red brown clay loam, overlying a well structured red clay becoming calcareous (Class I carbonate layer) with depth, overlying heavy clay within a metre of the surface*

Landform: Flats and lower slopes

Substrate: Red strongly structured heavy clay of Pleistocene age (Hindmarsh Clay equivalent)

Vegetation: Mallee scrub

Type Site:

Site No.:	CM030	1:50,000 mapsheet:	6530-2 (Blyth)
Hundred:	Everard	Easting:	251750
Section:	383	Northing:	6237000
Sampling date:	14/05/93	Annual rainfall:	385 mm average

Lower slope of outwash fan with a slope of 2% and a hard setting surface.

Soil Description:

Depth (cm)	*Description*
0-10	Dark reddish brown massive clay loam. Abrupt to:
10-20	Dark red medium clay with moderate coarse blocky structure. Abrupt to:
20-35	Yellowish red highly calcareous medium clay with weak coarse prismatic structure. Clear to:
35-50	Yellowish red very highly calcareous medium clay with 20-50% soft segregations of Class I carbonate. Clear to:
50-70	Red highly calcareous medium heavy clay with coarse prismatic structure and 20-50% soft carbonate segregations. Gradual to:
70-100	Red highly calcareous heavy clay with strong coarse prismatic structure and 2-10% soft carbonate segregations. Diffuse to:
100-160	Red and yellowish brown mottled heavy clay with strong blocky structure (Hindmarsh Clay equivalent).

Classification: Sodic, Hypercalcic, Red Dermosol; medium, non-gravelly, clay loamy/clayey, moderate

Summary of Properties

Drainage: The soil is moderately well drained. The sodic clay subsoil impedes water movement so that the profile may remain wet for a week or so after heavy rain.

Fertility: High nutrient retention capacity is indicated by the cation exchange data. The surface soil is naturally fertile but high subsoil pH and carbonate content may limit nutrient availability (especially zinc) at depth. Phosphorus level is low.

pH: Slightly alkaline at the surface, becoming strongly alkaline with depth.

Rooting depth: There are few roots below 35 cm and none below 100 cm.

Barriers to root growth:

Physical: The high strength of the Hindmarsh Clay restricts root development, but this does not appear until 70 cm at this site.

Chemical: Barriers to root growth are a combination of toxic levels of boron from 50 cm, high pH and carbonate content (Class I carbonate layer) from 35 cm, high ESP from 50 cm, and moderate salinity from 70 cm.

Waterholding capacity: Approximately 60 mm in rootzone.

Seedling emergence: Good to fair. The surface tends to seal over, depending on organic matter content and dispersiveness.

Workability: Good to fair. Without adequate organic matter (ideally 1.5% organic carbon) and /or gypsum application to overcome dispersiveness, the surface is liable to shatter if worked too dry and puddle if worked too wet.

Erosion Potential:

Water: Low to moderately low, depending on the degree of run-on from upslope.

Wind: Low.

Laboratory Data

Depth cm	pH H_2O	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	7.9	7.7	0.5	0.23	1.35	1.3	16	955	-	5.5	1.3	6	10.8	0.4	25.9	17.46	3.62	0.84	2.57	3.2
0-10	7.8	7.6	0.8	0.31	2.44	1.6	27	1012	-	4.8	1.2	5	10.9	0.4	23.3	17.07	2.84	0.46	2.61	2.0
10-20	8.1	7.8	0.2	0.21	1.19	0.8	7	723	-	4.4	1.4	6	5.4	0.2	24.9	17.02	3.37	0.88	1.97	3.5
20-35	8.7	8.0	34.1	0.48	2.44	0.2	7	308	-	4.5	1.9	7	4.0	0.1	18.1	9.65	4.39	2.64	0.73	14.6
35-50	9.1	8.3	36.9	0.93	4.12	0.4	6	369	-	15.3	1.9	5	3.3	0.2	19.3	6.49	7.12	5.64	0.89	29.2
50-70	9.2	8.6	23.3	1.41	5.49	0.2	7	577	-	36.7	1.3	6	2.9	0.2	26.5	5.28	9.85	8.83	1.51	33.3
70-100	9.2	8.8	5.4	1.93	7.51	0.1	5	762	-	77.0	1.1	7	1.3	0.1	32.3	4.73	12.35	11.79	1.97	36.5
100-160	8.5	8.2	<0.1	2.53	8.33	0.1	6	834	-	110.8	0.8	6	0.3	0.1	34.0	3.51	12.05	13.86	2.01	40.8

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