

## HARD GRADATIONAL RED CLAY LOAM

**General Description:** *Hard clay loam to light clay grading to a coarsely structured hard red clay, calcareous with depth*

**Landform:** Undulating rises.

**Substrate:** Coarsely structured hard red to brown clay (Hindmarsh Clay).

**Vegetation:** Mallee.



<b>Type Site:</b>	Site No.:	CM075	1:50,000 mapsheet:	6530-3 (Lochiel)
	Hundred:	Cameron	Easting:	237360
	Section:	580	Northing:	6252360
	Sampling date:	12/3/96	Annual rainfall:	410 mm average

Crest of spur, 3% slope. Hard setting surface with 10-20% quartzite stone (20-60 mm).

### Soil Description:

Depth (cm)	Description
0-10	Dark reddish brown firm cloddy light clay. Abrupt to:
10-30	Reddish brown firm medium clay with weak coarse prismatic breaking to moderate subangular blocky structure. Abrupt to:
30-57	Orange firm massive very highly calcareous light medium clay with more than 50% fine carbonate and 10-20% hard carbonate fragments. Clear to:
57-80	Orange firm massive very highly calcareous medium clay with more than 50% fine carbonate. Clear to:
80-100	Brown very hard very highly calcareous medium heavy clay with coarse prismatic structure and 10-20% fine carbonate. Gradual to:
100-155	Brown very hard heavy clay with coarse prismatic structure.



**Classification:** Sodic, Hypercalcic, Brown Dermosol; medium, gravelly, clayey / clayey, moderate



## Summary of Properties

- Drainage:** Well drained. Soil rarely remains wet for more than a few days.
- Fertility:** Inherent fertility is high as indicated by the exchangeable cation data. Phosphorus levels are low - regular applications are needed. Zinc deficiencies are common (marginal levels at sampling site). Organic carbon levels are low for a clayey soil in a 425 mm area.
- pH** Neutral at surface, strongly alkaline with depth.
- Rooting depth** 60 cm in pit.
- Barriers to root growth:**
- Physical:** Cloddy surface structure and prismatic structure from 10 to 30 cm create sub optimal conditions for root growth.
  - Chemical:** Conditions for root growth become unfavourable below 30 cm, as pH, sodicity and boron levels increase. Below 57 cm these factors all reach levels at which cereal root growth virtually ceases.
- Waterholding capacity:** Approximately 100 cm (high to moderate) in rootzone.
- Seedling emergence:** Fair, due to tendency of surface to seal and set hard. Organic matter levels need to be maintained to preserve surface structure.
- Workability:** Fair to good. Slight restriction on soil moisture range for effective cultivation.
- Erosion Potential:**
- Water:** Moderately low. Surface cover needs to be maintained to prevent erosion.
  - Wind:** Low.

## Laboratory Data

Depth cm	pH H <sub>2</sub> O	pH CaCl <sub>2</sub>	CO <sub>3</sub> %	EC1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	SO <sub>4</sub> 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	7.5	7.3	<0.1	0.18	1.23	1.2	21	509	8	1.8	1.03	11	17.5	0.45	20.0	13.77	3.05	0.32	1.42	1.6
0-10	7.2	6.8	<0.1	0.15	0.90	1.3	41	514	8	1.9	-	-	-	-	20.6	14.34	3.58	0.73	1.48	3.5
10-30	7.8	7.4	<0.1	0.12	0.62	0.7	5	339	-	3.3	-	-	-	-	28.9	19.38	4.84	0.61	1.18	2.1
30-57	8.9	8.0	41.2	0.30	1.46	0.5	5	172	22	2.7	-	-	-	-	15.1	9.10	4.90	1.81	0.63	11.9
57-80	9.5	8.4	42.2	0.81	4.02	<0.1	<4	343	50	17.4	-	-	-	-	16.0	3.44	8.55	5.80	1.03	36.3
80-100	9.6	8.7	20.1	1.08	2.68	0.1	<4	483	95	28.8	-	-	-	-	24.5	2.84	12.16	10.73	1.58	43.8
100-155	9.3	8.8	2.4	1.60	3.80	<0.1	<4	563	200	37.3	-	-	-	-	31.8	2.65	14.94	15.00	1.71	47.2

- 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](#)

