

COARSELY STRUCTURED GRADATIONAL RED CLAY LOAM

General Description: *Reddish brown clay loam overlying a strongly structured red brown clay becoming calcareous with depth and grading to a Class I carbonate layer in a heavy clay*

Landform: Gentle slopes

Substrate: Coarsely structured very firm red heavy clay (Hindmarsh Clay) with pockets of soft carbonate

Vegetation:



Type Site: Site No.: CM050

1:50,000 sheet:	6530-3 (Lochiel)	Hundred:	Cameron
Annual rainfall:	450 mm	Sampling date:	22/12/93
Landform:	Crest of an undulating rise, 3% slope		
Surface:	Firm with minor quartzite stones		

Soil Description:

<i>Depth (cm)</i>	<i>Description</i>
0-10	Dark reddish brown clay loam with weak subangular blocky structure. Abrupt to:
10-25	Dark reddish brown medium clay with strong prismatic breaking to polyhedral structure. Gradual to:
25-48	Red medium clay with strong very coarse prismatic structure. Abrupt to:
48-100	Yellowish red highly calcareous massive light medium clay with 10-20% pockets of soft Class I carbonate. Gradual to:
100-130	Yellowish red and pale brown moderately calcareous medium heavy clay (Hindmarsh Clay) with 20-50% pockets of soft Class I carbonate.



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

Summary of Properties

Drainage	The soil is well drained. The clayey subsoil restricts rapid drainage and the soil remains wet for a few days after heavy rain.
Fertility	The natural fertility of the soil is high, as indicated by the high cation exchange capacities (CEC) and high exchangeable calcium values. Organic carbon levels at the sampling site are satisfactory (not high), but phosphorus and potassium are very well supplied. Zinc deficiency may occur in some seasons.
pH	Alkaline at the surface, strongly alkaline with depth.
Rooting depth	130 cm in sampling pit, but there are very few roots below 100 cm.
Barriers to root growth	
Physical:	There are no physical barriers above 48 cm where the high exchangeable sodium percentages (ESP) appear. This soil is hard and does not allow good root penetration inside the clay aggregates.
Chemical:	High pH (more than 9.2 in water), high boron (more than 15 mg/kg), and high exchangeable sodium (more than 25%) restrict root growth below 48 cm.
Water holding capacity	Approximately 100 mm but not all is available due to low root densities.
Seedling emergence	Fair to good, depending on the structure of the surface soil. If organic carbon levels fall below 1.5%, the surface will lose its structure and seal over.
Workability	Good to fair, depending on the structural condition of the surface.
Erosion Potential	
Water:	Moderately low, due to the gentle slope and elevated position.
Wind:	Low.

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 -S 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	7.8	7.6	0.7	0.20	0.58	1.7	49	747	-	2.6	1.4	10	14.2	0.6	27.2	20.2	4.0	0.51	2.76	1.9
0-10	7.9	7.6	0.1	0.13	0.51	1.9	37	765	-	2.8	1.1	6	10.9	0.8	30.3	24.5	3.3	0.34	2.75	1.1
10-25	8.0	7.6	0.1	0.09	0.25	0.8	10	343	-	2.4	1.5	9	4.5	0.3	33.0	25.4	4.9	0.71	1.61	2.2
25-48	8.4	7.9	0.2	0.15	0.38	0.5	6	187	-	1.7	1.9	8	3.9	0.2	28.6	19.7	5.7	1.60	0.99	5.6
48-100	9.5	8.7	12.2	1.28	4.83	0.1	5	353	-	32.4	1.1	7	0.9	0.2	27.7	5.0	12.5	11.53	1.43	41.6
100-130	9.5	8.2	48.6	0.42	1.29	0.4	-	208	-	11.5	1.4	5	1.7	0.2	15.4	5.5	5.6	5.65	0.79	36.7

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.