

CALCAREOUS CLAY

General Description: *Well structured red calcareous clay becoming more clayey, more coarsely structured, and with slickensides at depth, usually with soft gypsum deep in the profile*

Landform: Gently inclined outwash fans below fine grained basement rock highs

Substrate: Gypseous clayey alluvium

Vegetation: Saltbush, black bluebush and acacia shrubland



Type Site: Site No.: CU057
 1:50,000 sheet: 6533-3 (Quorn) Hundred: Palmer
 Annual rainfall: 275 mm Sampling date: 17/11/95
 Landform: Midslope of a very gently inclined fan, 2% slope
 Surface: Firm with 10-20% quartzite stones

Soil Description:

Depth (cm)	Description
0-8	Red highly calcareous light clay with moderate polyhedral structure. Abrupt to:
8-20	Reddish brown highly calcareous medium clay with strong fine polyhedral structure. Abrupt to:
20-40	Reddish brown highly calcareous firm medium clay with strong very coarse blocky structure. Diffuse to:
40-70	Reddish brown highly calcareous firm medium clay with strong very coarse blocky structure and slickensides. Clear to:
70-100	Red highly calcareous firm medium clay with strong coarse blocky structure and 10-20% soft gypsum. Gradual to:
100-180	Red highly calcareous firm medium clay with strong fine polyhedral structure, 10-20% crystalline gypsum and 2-10% soft manganese segregations. Minor quartzite and ironstone gravel throughout profile.



Classification: Vertic, Pedal, Calcic Calcarosol; gravelly, clayey / clayey, very deep

Summary of Properties

Drainage	Well drained.
Fertility	The high CEC value (reflecting high clay content) indicates good nutrient storage potential.
pH	Alkaline throughout, but not strongly so.
Rooting depth	Good root growth to 70 cm, then only in old root channels to 140 cm.
Barriers to root growth	
Physical:	The hard, large clay aggregates from 20 cm restrict the degree to which roots can exploit moisture reserves within them.
Chemical:	High subsoil boron levels (from 100 cm), and moderate salinity from 70 cm (although this is mainly due to the gypsum).
Water holding capacity	Approximately 120 mm in root zone - in most seasons, the potential soil moisture store would not fill.
Seedling emergence:	Good, except where scalded.
Erosion Potential	
Water:	Moderately low due to low slope and high clay content, but presence of minor scalding indicates that this soil will erode.
Wind:	Low to moderate - overgrazing will pulverize surface soil leading to wind erosion loss.

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	7.6	6.9	<0.1	0.11	0.86	0.9	14	974	25	1.4	1.1	7.4	15	0.76	19.5	10.70	4.20	0.27	2.97	1.4
0-8	8.2	7.9	1.9	0.43	1.51	0.9	11	874	186	1.8	-	-	-	-	34.5	25.14	6.98	0.33	2.88	1.0
8-20	8.6	8.0	2.9	0.16	0.63	0.4	7	373	32	2.1	-	-	-	-	36.9	25.35	9.33	0.55	1.32	1.5
20-40	8.9	8.1	3.2	0.25	0.80	0.3	4	233	30	3.6	-	-	-	-	35.8	23.62	9.71	2.46	0.79	6.9
40-70	9.0	8.2	3.5	0.48	1.89	0.3	4	231	37	4.8	-	-	-	-	35.4	21.74	9.50	5.04	0.75	14.2
70-100	8.1	8.0	3.9	3.88	6.76	0.2	11	206	5304	10.3	-	-	-	-	34.1	24.08	9.88	6.36	0.74	18.7
100-180	8.3	8.2	6.3	4.87	8.52	0.1	18	229	2336	39.6	-	-	-	-	30.7	14.78	13.03	7.37	0.80	24.0

Note: Paddock sample bulked from 20 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.