

HARD GRADATIONAL CLAY LOAM

General Description: *Hard loam becoming more clayey and coarsely structured with depth, grading to a calcareous clay*

Landform: Alluvial plain

Substrate: Fine textured outwash sediments mantled by fine carbonates of aeolian origin

Vegetation:



Type Site: Site No.: CM095

1:50,000 sheet: 6530-1 (Koolunga) Hundred: Redhill
Annual rainfall: 410 mm Sampling date: 10/05/02
Landform: Flat alluvial plain, 0% slope
Surface: Hard setting with no stones

Soil Description:

Depth (cm)	Description
0 – 7	Dark reddish brown loam with weak coarse subangular blocky structure. Abrupt to:
7 – 21	Dark reddish brown light clay with coarse prismatic structure. Clear to:
21 – 35	Strong brown highly calcareous light clay with weak subangular blocky structure. Clear to:
35 – 70	Strong brown highly calcareous light clay with weak subangular blocky structure. Clear to:
70 – 120	Strong brown highly calcareous light clay with weak subangular blocky structure. Diffuse to:
120 – 180	Yellowish red moderately calcareous light medium clay with blocky structure.



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

Summary of Properties

- Drainage:** Moderately well drained. Soil is unlikely to remain wet for more than a week following heavy or prolonged rainfall.
- Fertility:** Good levels of phosphorus in surface soil (probably due to toxicity problems limiting uptake). Inherent fertility is very high as indicated by the exchangeable cation figures.
- pH:** Alkaline at the surface, strongly alkaline with depth.
- Rooting depth:** Some roots to 120 cm in the pit.
- Barriers to root growth:**
- Physical:** Highly sodic surface soil and very highly sodic subsoil lead to a dispersive and poorly structured soil.
 - Chemical:** Moderate salinity throughout profile. Very high born levels below 7 cm. Sodium levels are toxic (affecting crop yield) below 7 cm. Strongly alkaline below 21 cm.
- Water holding capacity:** Surface: approx. 130 mm/m over 0.07 m = 9 mm
 Upper subsoil: approx. 100 mm/m over 0.28 m = 28 mm
 Lower subsoil: approx. 30 mm/m over 0.85 m = 25 mm
 Total: = 62 mm (moderately low)
 Note: raised boron, sodium and salinity levels, and poor structure limit plant root exploration of subsoil layers. Due to the toxicity problems associated with this soil, plant available water holding capacity could be less than that estimated.
- Seedling emergence:** Fair to poor due to sodic surface. Organic matter levels need to be maintained to at least prevent soil structure from worsening. In particular, retention of stubbles should help to improve surface soil condition.
- Workability:** Fair to poor due to sodic surface.
- Erosion Potential**
- Water:** Low.
 - 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)				Sum cations cmol (+)/kg	Exchangeable Cations cmol(+)/kg				ESP
											Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
Paddock	8.2	7.7	0	0.62	6.1	1.55	36	576	28.0	7.0	0.98	10.5	22.0	1.52	26.0	15.0	5.19	4.33	1.47	16
0-7	8.3	7.7	0	0.56	6.0	1.68	56	526	18.1	8.3	1.00	14.6	18.1	1.74	25.6	14.6	5.06	4.59	1.34	18
7-21	9.0	8.3	3	0.97	6.0	0.80	13	590	80.8	46.7	2.00	14.6	6.10	0.73	41.7	15.8	10.2	13.8	1.87	33
21-35	9.4	8.6	34	1.15	6.5	0.39	9	438	111	51.5	1.33	8.61	2.12	0.33	33.2	10.5	8.37	13.1	1.27	39
35-70	9.4	8.5	36	1.45	8.8	0.20	5	279	218	28.9	1.28	10.8	0.99	0.30	30.1	9.09	7.04	13.2	0.76	44
70-120	9.4	8.5	30	1.58	10.5	0.16	4	251	275	19.2	0.73	8.20	1.01	0.33	30.3	8.72	7.22	13.7	0.69	45
120-180	9.0	8.5	12	2.21	13.4	0.14	9	349	373	17.7	0.51	10.1	1.37	0.36	40.4	8.83	10.9	19.8	0.87	49

Note: Paddock sample bulked from cores (0-10 cm) taken around the pit.

Sum of cations (an estimate of cation exchange capacity or CEC) 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 estimated CEC.