

CLAY LOAM OVER POORLY STRUCTURED RED CLAY

General Description: *Red brown massive loam to clay loam overlying a red brown dispersive clay, with a Class I carbonate layer grading to fine textured alluvium*

Landform: Alluvial flats and old flood plains

Substrate: Red and brown clayey alluvium with soft carbonate segregations decreasing with depth

Vegetation: Mallee scrub



Type Site: Site No.: CM024

1:50,000 sheet: 6530-1 (Koolunga)

Hundred: Boucaut

Annual rainfall: 350 mm

Sampling date: 15/05/93

Landform: Alluvial plain associated with the lower reaches of Magpie Creek, 1% slope

Surface: Hard setting with no stones

Soil Description:

Depth (cm)	Description
0-9	Dark reddish brown massive clay loam. Abrupt to:
9-20	Dark reddish brown medium clay with strong coarse prismatic structure. Clear to:
20-30	Dark reddish brown medium heavy clay with strong polyhedral structure. Gradual to:
30-50	Dark red moderately calcareous weakly structured medium clay. Gradual to:
50-90	Red massive highly calcareous fine sandy light clay with minor soft carbonate segregations (Class I carbonate). Diffuse to:
90-150	Yellowish red highly calcareous weakly structured light clay with minor carbonate segregations.



Classification: Calcic, Subnatric, Red Sodosol; thin, non-gravelly, clay loamy / clayey, moderate

Summary of Properties

Drainage	The sodic clay subsoil has low permeability and will cause temporary waterlogging following rain. However the soil is unlikely to remain wet for more than a week in most years.
Fertility	Inherent fertility is moderately high as indicated by the exchangeable cation data. There are no apparent deficiencies at the sampling site, although organic carbon levels (an indicator of surface soil fertility) are sub-optimal, a value of 1.3% being desirable.
pH	Slightly alkaline at the surface, strongly alkaline with depth.
Rooting depth	There are few roots below 50 cm in sampling pit, and below 90 cm, roots only occur in vertical biopores.
Barriers to root growth	
Physical:	The dispersive clay subsoil has a high strength and restricts root development. Roots are commonly confined to the surfaces of clay aggregates in these soils.
Chemical:	High exchangeable sodium is the main chemical barrier, although its effects are mainly on soil structure. The very high pH in the Class I carbonate reduces the availability of a range of nutrients.
Water holding capacity	Approximately 75 mm in root zone.
Seedling emergence	Moderate due to the tendency of the surface to seal over.
Workability	Moderate, due to the poorly structured surface. Increased organic matter and gypsum applications will improve workability and seedling emergence.
Erosion Potential	
Water:	Low, due to the flat terrain. The soil itself however is highly erodible.
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	7.7	7.3	0	0.14	0.74	0.9	36	618	-	1.9	0.8	7	10.7	0.5	11.9	7.28	2.15	0.34	1.09	2.9
0-9	7.5	7.2	0	0.13	0.97	0.9	52	641	-	1.5	0.7	6	9.9	0.4	12.4	7.48	1.96	0.17	1.07	1.4
9-20	8.1	7.4	0	0.13	0.36	0.7	8	645	-	4.6	1.1	8	5.5	0.2	28.4	13.49	9.23	2.93	1.66	10.3
20-30	9.0	8.2	0.2	0.25	0.50	0.5	5	548	-	6.3	1.0	8	3.1	0.2	26.8	10.23	10.25	4.69	1.22	17.5
30-50	9.3	8.6	1.3	0.35	0.59	0.4	6	481	-	7.0	0.7	6	2.4	0.1	21.2	6.11	7.96	4.90	0.86	23.1
50-90	9.7	8.7	3.6	0.48	1.03	0.2	7	433	-	9.5	0.7	4	1.8	0.1	15.0	3.82	6.12	5.68	0.75	37.9
90-150	9.2	8.5	8.7	1.33	7.93	0.2	10	494	-	14.5	0.6	4	1.1	0.2	17.0	4.30	7.65	6.73	0.98	39.6

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.