

SANDY LOAM OVER POORLY STRUCTURED RED CLAY

General Description: *Thin hard sandy loam overlying a coarsely structured red clay, calcareous with depth*

Landform: Gently undulating rises

Substrate: Clay (weathering product of underlying gneissic basement rock), mantled by fine carbonates.

Vegetation: Mallee



Type Site: Site No.: CY044

1:50,000 sheet: 6429-2 (Ardrossan) Hundred: Cunningham
Annual rainfall: 450 mm Sampling date: 16/05/02
Landform: Midslope of gently undulating rise, 3% slope
Surface: Firm with occasional cracks, 2-10% quartz gravel (2-6 mm) and less than 2% calcrete fragments (6-20 mm)

Soil Description:

Depth (cm)	Description
0-8	Dark reddish brown very firm massive sandy loam with 2-10% quartz gravel (2-6 mm). Sharp to:
8-33	Red very hard medium clay with strong very coarse prismatic structure, breaking to coarse angular blocky. Clear to:
33-60	Red hard highly calcareous medium clay with strong medium angular blocky structure and 10-20% fine carbonate segregations. Gradual to:
60-100	Yellowish red very firm very highly calcareous medium clay with weak medium subangular blocky structure, more than 50% fine and 2-10% nodular carbonate segregations. Gradual to:
100-120	Reddish yellow very firm very highly calcareous massive light clay with more than 50% fine carbonate segregations.



Classification: Hypercalcic, Subnatric, Red Sodosol; thin, slightly gravelly, loamy / clayey, deep

Summary of Properties

Drainage: Moderately well drained. Water perches on top of the dispersive clayey subsoil for up to a week following heavy or prolonged rainfall.

Fertility: Inherent fertility is moderate, as indicated by the exchangeable cation data. Concentrations of all measured nutrient elements are adequate, although calcium to magnesium ratio is low at the surface. Organic carbon levels are satisfactory for this soil type and rainfall.

pH: Neutral at the surface, strongly alkaline with depth.

Rooting depth: 80 cm in pit, but few roots below 60 cm.

Barriers to root growth:

Physical: The hard dispersive clayey subsoil restricts root growth by confining most of the finer roots to the faces of the aggregates. Capacity to exploit water and nutrient reserves inside aggregates is diminished.

Chemical: High pH from 33 cm, high sodicity from 60 cm and high salinity from 100 cm limit root growth.

Water holding capacity: Approximately 65 mm in the root zone.

Seedling emergence: Surface soil tends to seal, inhibiting even emergence.

Workability: Poor surface structure limits opportunities for safe cultivation.

Erosion Potential

Water: Moderate, due to poor surface structure, thin surface soil and slowly permeable subsoil.

Wind: Moderately 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 of cations cmol (+)/kg	Exchangeable Cations cmol(+)/kg				ESP
											Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
Paddock	7.5	6.9	0.9	0.19	nd	1.23	52	375	12.7	1.6	0.45	40	5.27	1.35	18	12.04	4.19	1.08	0.95	5.9
0-8	7.4	6.9	0.4	0.18	nd	1.39	63	351	13.1	1.4	0.88	45	5.46	1.41	13	9.76	2.17	0.58	0.92	4.3
8-33	8.6	7.8	0.8	0.41	nd	0.35	4	372	19.1	4.7	0.87	21	1.89	0.26	36	17.67	12.76	4.69	0.94	13.0
33-60	9.4	8.4	6	0.62	nd	0.38	4	416	75.8	10.6	1.73	18	1.41	0.26	39	14.53	13.62	9.34	1.05	24.2
60-100	9.4	8.4	4	1.09	nd	0.40	2	392	151	12.8	1.04	17	1.40	0.18	37	11.93	11.34	12.61	1.02	34.2
100-120	8.9	8.4	11	4.28	nd	0.45	7	184	418	7.3	0.49	17	1.33	0.28	46	10.74	10.41	24.19	0.50	52.8

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

Sum of cations (an estimate of 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 estimated CEC.