SANDY LOAM OVER POORLY STRUCTURED RED CLAY

General Description: *Thin gritty loamy sand to sandy loam over a coarsely structured red clay, calcareous with depth*

Landform: Undulating rises.

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

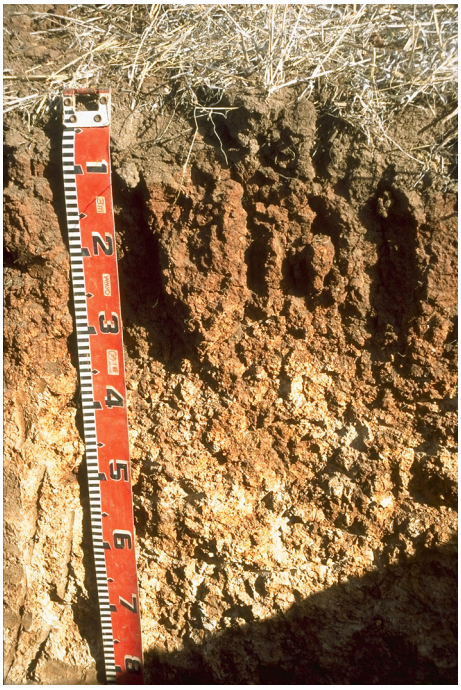
Vegetation: Mallee

Type Site:

Site No.:	CY045	1:50,000 mapsheet:	6429-2 (Ardrossan)
Hundred:	Cunningham	Easting:	758050
Section:	135	Northing:	6196950
Sampling date:	16/05/2002	Annual rainfall:	420 mm average

Lower slope of undulating rise, 4% slope. Soft surface with 2-10% quartz gravel (6-20 mm).

Soil Description:



Depth (cm)	*Description*
0-7	Dark brown firm massive light coarse sandy loam. Sharp to:
7-25	Red hard medium clay with strong very coarse prismatic structure, breaking to strong coarse sub-angular blocky, and minor quartz grit. Gradual to:
25-40	Red very firm highly calcareous medium clay with strong coarse subangular blocky structure, 2-10% fine carbonate segregations and minor quartz grit. Gradual to:
40-60	Yellowish red very firm very highly calcareous medium clay with weak coarse subangular blocky structure, more than 50% fine carbonate segregations and 2-10% soft gneiss fragments. Diffuse to:
60-100	Yellowish red and brown firm very highly calcareous medium clay with weak angular blocky structure, 20-50% fine carbonate segregations and 2-10% soft gneiss fragments. Diffuse to:
100-130	Reddish yellow, brownish yellow and red firm massive light clay with 20-50% fine carbonate segregations and 10-20% soft gneiss fragments.

Classification: Hypercalcic, Mesonatric, 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: 60 cm in the pit, but few roots below 40 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 and sodicity from 40 cm and high salinity from 100 cm limit root growth.

Waterholding capacity: Approximately 55 mm in the rootzone.

Seedling emergence: Satisfactory to patchy, depending on degree of surface sealing.

Workability: Satisfactory to fair.

Erosion Potential:

Water: Moderate due to slowly permeable subsoil at shallow depth, and position on slope.

Wind: Moderately low.

Laboratory Data

Depth cm	pH H_2O	pH $CaCl_2$	CO_3 %	EC1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	SO_4 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	6.9	6.2	<1	0.13	nd	1.43	73	213	7.5	1.3	0.71	107	6.58	0.86	11	6.44	2.75	1.37	0.54	12.3
0-7	6.9	6.7	<1	0.20	nd	2.42	104	284	12.2	1.2	1.22	126	6.20	2.12	10	6.74	2.07	0.94	0.71	9.0
7-25	8.9	7.9	2	0.60	nd	0.62	7	316	17.3	2.7	0.45	24	2.03	0.20	38	18.70	12.46	6.96	0.80	18.3
25-40	9.1	8.2	6	0.75	nd	0.54	5	284	40.7	3.6	0.58	16	1.55	0.33	38	17.52	11.11	8.30	0.74	22.0
40-60	9.3	8.2	13	0.96	nd	0.38	2	260	127	4.2	0.47	13	1.36	0.24	30	12.59	7.77	8.83	0.66	29.6
60-100	9.3	8.3	13	1.35	nd	0.23	2	327	152	3.5	0.39	13	1.48	0.25	32	11.00	8.91	11.19	0.84	35.0
100-130	8.8	8.2	12	3.55	nd	0.40	2	316	225	3.8	0.34	14	2.04	0.53	41	11.08	10.75	18.45	0.82	44.9

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.

Further information: DEWNR Soil and Land Program