

SANDY LOAM OVER POORLY STRUCTURED RED CLAY

General Description: *Hard setting sandy loam abruptly overlying a coarsely structured red dispersive clay, calcareous with depth and grading to a gypseous clay*

Landform: Level plain.

Substrate: Coarsely structured reddish clay with segregations of gypsum and manganese.

Vegetation: Mallee.



Type Site: Site No.: CU068
 1:50,000 sheet: 6531-3 (Crystal Brook) Hundred: Wandearah
 Annual rainfall: 350 mm Sampling date: 22/01/01
 Landform: Very slight depression in flat plain, 0% slope
 Surface: Hard setting with no stones

Soil Description:

Depth (cm)	Description
0-10	Dark reddish brown hard massive sandy loam. Sharp to:
10-30	Red very hard dispersive medium heavy clay with strong coarse prismatic structure. Clear to:
30-45	Red hard medium clay with strong medium angular blocky structure. Gradual to:
45-70	Red firm moderately calcareous medium clay with strong medium angular blocky structure. Gradual to:
70-150	Yellowish red very highly calcareous hard medium clay with strong coarse angular blocky structure and 2-10% fine carbonate segregations. Diffuse to:
150-200	Yellowish red highly calcareous strongly lenticular medium clay with 10-20% tubular and crystalline gypsum, and 2-10% soft manganese segregations.



Classification: Calcic, Subnatric, Red Sodosol; medium, non-gravelly, loamy / clayey, deep

Summary of Properties

Drainage: Imperfect. Water may perch on top of the dispersive clayey subsoil for several weeks following heavy or prolonged rainfall.

Fertility: Inherent fertility is moderate, as indicated by the exchangeable cation data. The sandy loam surface has sub-optimal nutrient retention capacity, but the capacity of the clayey subsoil is high. The test data indicate that sulphur concentration is marginal, although subsoil reserves are high. Organic carbon levels are low.

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

Rooting depth: 70 cm in pit, but few roots below 45 cm.

Barriers to root growth:

Physical: The hard setting surface impedes roots during establishment, and the dispersive clayey subsoil restricts root proliferation.

Chemical: High pH, high boron levels and high sodicity from 45 cm restrict deeper root growth. Deep subsoil salinity is also moderately high.

Water holding capacity: Approximately 60 mm in the root zone.

Seedling emergence: Fair to poor due to hard setting sealing surface.

Workability: Fair to poor. Soil has a limited moisture range for effective working.

Erosion Potential

Water: Low.

Wind: Low.

Laboratory Data

Depth cm	pH H ₂ O	pH CaCl ₂	CO ₃ %	EC1:5 dS/m	Cl mg/kg	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	6.9	5.7	-	0.09	41	0.50	60	350	4.8	1.3	1.17	-	27.0	1.42	6.96	3.40	2.17	0.57	0.77	8.2
0-10	6.7	5.4	-	0.06	21	0.43	64	300	3.0	1.1	1.10	-	27.0	1.51	5.49	2.90	1.54	0.33	0.67	6.0
10-30	8.6	7.0	-	0.11	27	0.39	10	570	2.0	5.2	1.87	-	9.62	0.41	19.53	7.50	8.00	2.70	1.28	13.8
30-45	9.3	8.0	-	0.22	56	0.25	5	510	7.3	12.0	1.39	-	2.92	0.22	23.22	6.50	10.67	4.87	1.13	21.0
45-70	9.6	8.6	-	0.64	195	0.20	5	540	31	23.0	1.79	-	1.73	0.29	29.51	6.90	13.00	8.35	1.21	28.3
70-150	9.7	8.6	-	0.81	440	0.20	6	440	115	17.0	1.27	-	1.26	0.32	27.41	7.70	10.33	8.35	0.97	30.5
150-200	9.2	8.5	-	1.47	1040	0.20	10	400	480	16.0	0.98	-	0.84	0.21	28.67	8.10	9.83	9.78	0.90	34.1

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

Sum of cations is an estimate of CEC (cation exchange capacity), 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.