

SANDY LOAM OVER POORLY STRUCTURED RED CLAY

General Description: *Thin hard 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.: CY047

1:50,000 sheet: 6429-2 (Ardrossan) Hundred: Maitland
 Annual rainfall: 475 mm Sampling date: 16/05/02
 Landform: Lower slope of an undulating rise, 2% slope
 Surface: Hard setting with 2-10% quartz gravel (6-20 mm)

Soil Description:

<i>Depth (cm)</i>	<i>Description</i>
0-9	Dark reddish brown firm massive sandy loam with 2-10% quartz grit. Abrupt to:
9-20	Reddish brown very hard medium clay with strong very coarse prismatic breaking to coarse angular blocky structure, and minor quartz grit. Clear to:
20-40	Reddish brown hard medium clay with strong coarse prismatic breaking to strong coarse angular blocky structure, 2-10% fine carbonate segregations and minor quartz grit. Clear to:
40-85	Red very firm highly calcareous medium clay with strong medium subangular blocky structure, 20-50% fine carbonate segregations, 2-10% carbonate fragments (6-20 mm) and minor quartz grit. Clear to:
85-130	Reddish yellow very firm massive very highly calcareous light medium clay with more than 50% fine carbonate segregations and minor quartz grit.



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 slightly low at the surface. Organic carbon levels are high for this soil type and rainfall.

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

Rooting depth: 85 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 boron concentration from 40 cm restrict deeper root growth.

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

Seedling emergence: Patchy due to hard setting sealing surface.

Workability: Fair. Poor surface structure limits the amount of time for effective working.

Erosion Potential

Water: Moderate, despite low slope angle. Soil is highly erodible, and site is subject to run on water from upslope.

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	6.8	6.2	<1	0.18	nd	1.65	45	521	5.4	2.0	0.77	48	17.1	1.19	19	12.69	4.12	0.77	1.31	4.1
0-9	6.5	6.3	<1	0.20	nd	1.70	51	450	5.9	1.3	0.60	61	22.5	2.08	11	7.94	1.26	0.52	1.15	4.8
9-20	7.7	7.1	<1	0.13	nd	0.32	4	354	2.2	1.5	0.48	23	3.38	0.15	17	11.01	3.91	0.69	0.90	4.2
20-40	8.7	7.9	1	0.27	nd	0.33	3	561	4.6	6.4	1.56	14	1.42	0.21	38	18.97	14.40	3.29	1.40	8.6
40-85	9.3	8.3	12	0.48	nd	0.24	3	544	52.1	18.2	1.38	10	1.07	0.16	35	12.13	14.86	6.35	1.38	18.3
85-130	9.4	8.2	13	0.60	nd	0.39	6	221	183	8.1	0.39	11	1.24	0.35	21	9.53	6.06	4.90	0.59	23.2

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.