

SHALLOW BLACK LOAM ON CLAY

General Description: *Poorly structured black loam over black clay with a thick rubbly calcrete pan and a shallow watertable*

Landform: Low plain.

Substrate: Marly clay of the Padthaway Formation.

Vegetation: Saltwater tea tree



Type Site: Site No.: SE106

1:50,000 sheet: 6924-4 (Gyp Gyp)

Hundred: Minecrow

Annual rainfall: 600 mm

Sampling date: 26/09/05

Landform: Level plain.

Surface: Hard setting with no stones. Watertable at 72 cm.

Soil Description:

Depth (cm)	Description
0-5	Compacted massive black loam. Many roots present. Sharp to:
5-28	Black heavy clay with coarse prismatic peds breaking to moderate sub-angular blocky structure. Roots common. Sharp to:
28-34	Fractured calcrete pan with pockets of fine calcrete rubble and friable black clay (10% of volume). Roots common in clay. Sharp to:
34-52	Fractured calcrete pan. No roots. Sharp to:
52-72	Fractured calcrete pan with seams of moist grey brown massive light clay (70% of volume) and coarse calcrete rubble. Sharp to:
72+	Watertable



Classification: Lithocalcic, Mesonatric, Black, Sodosol; thin, non-gravelly, loamy/clayey, shallow
or:
 Sodosolic, Salic Hydrosol; thin, non-gravelly, loamy/clayey, shallow

Summary of Properties

Drainage: Due to its poor structure and high clay content, the soil above the calcrete pan has low permeability. Water is likely to pond or run off the surface soil during wet winters. However the rubbly lower profile is likely to be quite permeable. Site drainage is poor due to the low flat topography and the presence of a shallow watertable.

Fertility: As indicated by the CEC in the table below, inherent fertility is naturally high. P levels are very low for pasture, and are likely to be a limiting factor for pasture vigour. K status is high, probably relating to the mineralogy of the clay. Sulphate sulphur is probably adequate for pasture.

pH: Moderately alkaline at the surface, becoming very strongly alkaline below the rootzone. Soil pH greater than 9.2 in water is likely to restrict root growth.

Rooting depth: 34 cm.

Barriers to root growth:

Physical: Poor structure and compact condition of the surface, and the coarse structure of the subsoil are likely to reduce the efficiency of the soil to provide air, water and nutrients to plant roots and will impact on overall plant vigour. The calcrete pan at 28 cm is fractured and includes some clay, allowing roots beyond this point. Carbonate gravel significantly reduces waterholding capacity between 28 and 34 cm. Fluctuating watertable is likely to saturate the lower part of the profile for significant periods.

Chemical: Most of the profile is highly alkaline, and the soil is sodic to highly sodic throughout. The high sodicity may also further degrade the soil's structure.

Water holding capacity: Total available water is estimated to be around 30 mm within the root zone.

Seedling emergence: Fair. The compacted and potentially dispersive surface may reduce emergence through waterlogging and some surface sealing.

Workability: Fair. Access may be restricted during the winter months, and the watertable may come to the surface.

Erosion Potential

Water: Low

Wind: Low.

Laboratory Data

Depth cm	pH H ₂ O	pH CaCl ₂	N mg/kg	CO ₃ %	EC 1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	Cl mg/kg	SO ₄ -S mg/kg	Iron mg/kg	Trace Elements mg/kg (EDTA)				CEC cmol (+)/kg	Exchangeable Cations cmol(+)/kg				ESP
													Cu	Fe	Zn	Mn		Ca	Mg	Na	K	
Paddock	7.2			0.3	0.18		2.2									16	3.8	6.7	0.9	1.1	5.6	
0-5	8.0	7.1	4		0.105		1.33	5	231		5.7	203										
5-28	8.6	7.5	8	0.5	0.349		0.98	9	695		11.2	494				21	3.4	7.8	4.1	1.8	19.5	
28-34																						
34-52	9.9			35.6	0.40		0.8									23	4.0	7.8	9.1	2.7	39.6	
52-72	9.9			41.4	0.51		0.0									23	3.5	8.2	9.1	2.7	39.6	

Note: CEC figures measured independently of exchangeable cations, using NH₄ extraction. ESP (exchangeable sodium percentage) is derived by dividing the exchangeable sodium value by the CEC. Shaded data estimated from samples collected in same pit on 23/03/05, mainly at 10 cm depth intervals.