

WET BLACK CLAY ON MARL

General Description: *Well structured black clay over highly calcareous marly clay with a shallow watertable*

Landform: Low plain.

Substrate: Marly clay of the Padthaway Formation.

Vegetation: Saltwater tea tree.



Type Site:	Site No.:	SE107	1:50,000 mapsheet:	6924-4 (Gyp Gyp)
	Hundred:	Landseer	Easting:	416740
	Section:	15	Northing:	5946840
	Sampling date:	26/09/2005	Annual rainfall:	600 mm average

Level plain. Watertable at 65 cm.

Soil Description:

Depth (cm)	Description
0-14	Moist slightly calcareous very dark grey light clay with fine polyhedral structure. Many roots present. Clear to:
14-22	Wet dark grey highly calcareous light clay with grey mottles. Fine polyhedral structure, with roots common. Gradual to:
22-41	Wet greyish brown weakly polyhedral highly calcareous light clay. Roots common. 7% fine calcrete gravel. Abrupt to:
41-50	Wet massive slightly calcareous dark greyish brown light medium clay. An occasional root present. Abrupt to:
50-68	Very abundant calcrete gravel (70%), with wet firm greyish brown calcareous light clay. Sharp to:
68+	Watertable and calcrete pan.



Classification: Melanic, Marly, Hypercalcic, Calcarosol; medium, non-gravelly, clayey / clayey, moderate or Calcarosolic, Salic Hydrosol; medium, non-gravelly, clayey / clayey, moderate



Summary of Properties

Drainage: Due to its good structure, the upper profile is quite permeable for a clay soil. Water is likely to perch on the more poorly structured clay sub soil. 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 very high. P levels are adequate for pasture. K status is high, probably relating to the mineralogy of the clay. Sulphate sulphur is high.

pH: Strongly alkaline throughout. Soil pH greater than 9.2 in water generally restricts root growth, and tolerant pasture species will be required.

Rooting depth: Most roots are restricted to the top 41 cm of soil. An occasional root may be found below this to a depth of 68 cm.

Barriers to root growth:

Physical: No physical barriers in top 30 cm. Poorly structured clay occurs between 30 cm and 61cm. A calcrete pan is present at 30 cm, however, this is fractured, allowing roots beyond this point. The carbonate gravel will significantly reduce the waterholding capacity of the soil between 30 and 61cm. A fluctuating watertable is likely to saturate the lower part of the profile for significant periods.

Chemical: The soil is strongly alkaline and strongly sodic throughout. The moderate level of salinity in the soil surface and higher salinity in the subsoil appears to be maintaining a stable structure in soils that would otherwise be highly dispersive under non-saline conditions. The salinity will inhibit some plant species, however, the extreme pH and exchangeable sodium levels will be the dominant inhibitors of pasture growth.

Waterholding capacity: Total available water is estimated to be around 55 mm within the rootzone.

Seedling emergence: Fair to good. The clay surface may seal over and reduce emergence.

Workability: Fair. Clayey surface will become sticky and intractable when wet. Access will 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	Mn	Zn		Ca	Mg	Na	K	
0-10	9.9			11.5		0.73	2.7									29	5.3	9.3	13.0	2.4	44.8	
0-14	9.0	7.9	19		0.201		3.3	30	666		22.3	866										
14-22	9.4	8.0	7	22.7	0.25	1.07	1.68	18	764		21.4	641				28	3.7	10.0	13.0	2.0	46.4	
22-41	9.5	8.3	3	41.8	0.67	1.43	0.63	11	688		21.8	391				23	2.2	10.2	12.5	2.5	54.3	
41-50	9.4	8.5	4	54.3	0.736	1.35	0.53	3	925		17.3	812				19	2.8	8.5	7.7	2.0	40.5	
50-68	9.5	8.3	3		0.649		0.48	7	560		15.2	291										

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.

Further information: [DEWNR Soil and Land Program](#)

