

WET BLACK CLAY ON MARL

General Description: *Well structured calcareous 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.:	SE911	1:50,000 mapsheet:	6924-4 (Gyp Gyp)
	Hundred:	Landseer	Easting:	416740
	Section:	15	Northing:	5946850
	Sampling date:	26/09/05	Annual rainfall:	575 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: Epihypersodic, Marly, Hypercalcic, Calcarosol; medium, non-gravelly, clayey/clayey, moderate or: Natric, Calcarosolic, Oxyaquic 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 61 cm. 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 61 cm. 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](#)

