

BLACK CLAY

General Description: *Well structured black seasonally cracking clay, becoming browner, mottled and less well structured with depth, over buried soils and river alluvium*

Landform: Low lying flats of the lower reaches of the Bremer River.

Substrate: Medium grained alluvium.

Vegetation:



Type Site: Site No.: CH144

1:50,000 sheet: 6727-3 (Alexandrina) Hundred: Bremer
 Annual rainfall: 390 mm Sampling date: 18/10/05
 Landform: Alluvial terrace of lower Bremer River
 Surface: Hard, seasonally cracking with no stones

Soil Description:

Depth (cm)	Description
0-10	Black firm light medium clay with moderate granular structure. Clear to:
10-25	Black firm light medium clay with strong fine polyhedral structure. Gradual to:
25-55	Very dark grey firm medium clay with strong coarse subangular blocky structure. Gradual to:
55-80	Brown firm fine sandy light clay with weak coarse subangular blocky structure. Diffuse to:
80-105	Dark yellowish brown, strong brown and yellowish red mottled firm light clay with weak coarse subangular blocky structure. Gradual to:
105-125	Brown and strong brown mottled firm medium clay with strong polyhedral structure and 10-20% soft carbonate segregations (buried subsoil of older soil profile). Clear to:
125-160	Strong brown, yellowish brown and yellowish red mottled friable massive light sandy clay loam (old river alluvium)



Classification: Melanic-Sodic, Eutrophic, Black Dermosol; medium, non-gravelly, clayey / clayey, deep

Summary of Properties

- Drainage:** Moderately well to imperfectly drained. The subsoil is likely to remain wet for a week or two following heavy or prolonged rainfall during winter. Deep drainage is assisted by the relatively sandy material from 125 cm.
- Fertility:** Inherent fertility is high, as indicated by the exchangeable cation data. Moderate to high clay content throughout ensures ample nutrient retention capacity. Apart from a possible zinc deficiency (common on black clays), the profile at the sampling site is well supplied with nutrient elements.
- pH:** Neutral at the surface, alkaline with depth.
- Rooting depth:** Strong root growth to 55 cm, with a few roots extending to 105 cm.
- Barriers to root growth:**
- Physical:** The clayey texture restricts even root distribution to some extent, but not considered significant.
- Chemical:** Marginally high salinity and sodicity from 55 cm may have some impact on root growth. High chloride from 105 cm is likely to have a greater effect.
- Water holding capacity:** (Estimates for potential root zone of grape vines – approximately 75 cm)

Total available: 110 mm
Readily available: 55 mm

- Seedling emergence:** Fair due to hard setting surface.
- Workability:** Fair to poor. Soil tends to shatter if worked too dry and becomes sticky when wet.
- Erosion Potential**
- Water:** Low.
- Wind:** Low.

Laboratory Data

Depth cm	pH H ₂ O	pH CaCl ₂	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	Boron mg/kg	Trace Elements mg/kg (EDTA)				Sum cations cmol (+)/kg	Exchangeable Cations cmol(+)/kg				Est. ESP
												Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
0-10	7.2	6.9	0	0.18	2.18	3.00	74	633	21	108	1.3	7.18	115	128	6.91	30.6	21.7	6.55	0.71	1.65	2.3
10-25	7.2	6.6	0	0.20	2.09	2.02	8	316	41	103	1.2	3.92	81	134	1.65	30.0	18.1	9.82	1.19	0.87	4.0
25-55	7.4	6.9	0	0.36	3.31	0.92	4	219	125	189	1.3	5.01	75	127	1.12	33.7	15.4	14.9	2.72	0.70	8.1
55-80	7.5	7.1	0	0.40	4.82	0.39	4	178	224	188	0.9	3.27	46	105	0.60	22.6	8.55	10.9	2.67	0.52	11.8
80-105	7.6	7.1	0	0.45	5.20	0.21	4	172	343	192	0.8	2.21	36	78.2	0.49	19.3	7.06	8.75	2.96	0.48	15.4
105-125	8.2	7.7	3.0	0.63	5.01	0.28	2	238	678	162	1.1	1.69	22	15.2	0.64	32.2	15.3	11.4	4.74	0.73	14.7
125-160	7.7	7.4	0.5	0.46	5.42	0.16	2	139	617	56.6	0.8	1.20	23	40.6	0.38	17.4	6.44	7.80	2.71	0.40	15.6

- Note:** Sum of cations, in a neutral to alkaline soil, approximates the 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 CEC, in this case estimated by the sum of cations.