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 mapsheet:	6727-3 (Alexandrina)
Hundred:	Bremer	Easting:	322930
Section:	2815	Northing:	6083110
Sampling date:	18/10/05	Annual rainfall:	405 mm average

Alluvial terrace of lower Bremer River. Hard, cracking surface 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.

Waterholding capacity: (Estimates for potential rootzone 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: Low.

Laboratory Data

Depth cm	pH H_2O	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.

Further information: DEWNR Soil and Land Program