BLACK CRACKING CLAY

General Description: *Black coarsely structured silty clay to medium clay, becoming more clayey and sometimes calcareous with depth*

Landform: Alluvial plains and flats associated with the lower reaches of the Angas and Bremer Rivers

Substrate: Fine grained alluvial sediments

Vegetation: Red and blue gum woodland

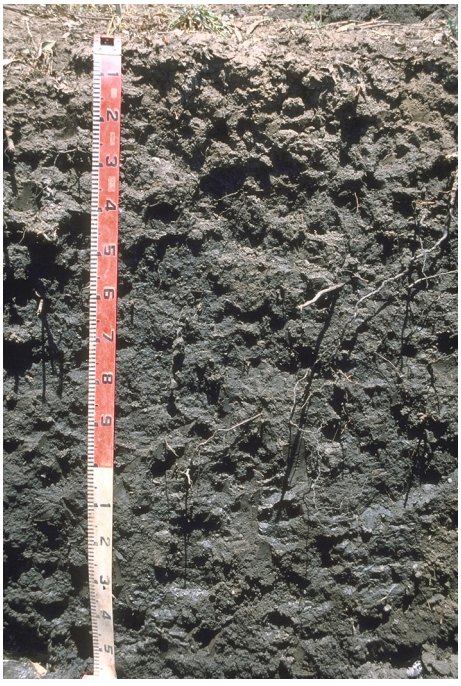
Type Site:

Site No.:	CH051	1:50,000 mapsheet:	6727-3 (Alexandrina)
Hundred:	Bremer	Easting:	322050
Section:	3576	Northing:	6088700
Sampling date:	18/08/93	Annual rainfall:	400 mm average

River terrace, at foot of levee adjacent to the Bremer River. Cracking surface. Watertable (5,000 ppm) at 160 cm, December 1993.

Soil Description:

Depth (cm)	*Description*
0-10	Very dark grey medium clay with strong polyhedral structure. Clear to:
10-20	Very dark grey medium heavy clay with strong polyhedral structure. Clear to:
20-50	Black heavy clay with strong angular blocky structure. Diffuse to:
50-100	Black heavy clay with strong angular blocky structure. Diffuse to:
100-150	Black heavy clay with strong angular blocky structure. Gradual to:
150-200	Very dark brown heavy clay with strong very coarse prismatic structure.



Classification: Episodic, Epipedal, Black Vertosol; non-gravelly, medium fine / very fine, very deep

Summary of Properties

Drainage: The soil is imperfectly drained, due to its clayey texture and shallow water table. The soil may remain wet for several weeks.

Fertility: The natural fertility is very high, as indicated by the very high cation exchange capacity and base status. Phosphorus and organic matter levels are very high.

pH: Neutral at the surface, slightly alkaline with depth.

Rooting depth: 150 cm in pit, but few roots below 50 cm.

Barriers to root growth:

Physical: High clay strength may restrict the development of root systems in some rootstock varieties.

Chemical: Salinity and sodicity are sufficiently high to kill vines at this site. Critical values are ECe of 2 dS/m and ESP of 15 respectively. These salinity and sodicity levels are not typical of this soil group, but are caused by the shallow saline water table.

Waterholding capacity: More than 150 mm (very high), although this is not all available due to uneven root distribution and cracking soil (prevents efficient capillary movement of water).

Seedling emergence: Moderate to good, provided that organic matter is preserved.

Workability: Moderate. The clayey soil is sticky when wet.

Erosion Potential:

Water: Low.

Wind: Low.

Laboratory Data

Depth cm	pH H_2O	pH $CaCl_2$	CO_3 %	EC1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	SO_4 mg/kg	Boron mg/kg	Trace Elements mg/kg (DTPA)				CEC cmol (+)/kg	Exchangeable Cations cmol(+)/kg				ESP
											Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
Row	6.9	6.8	0	0.93	4.10	2.6	100	645	-	3.7	10.8	123	21.9	38.1	24.8	20.15	7.00	1.87	1.57	7.5
0-10	7.2	7.1	0	2.39	11.6	2.8	100	766	-	4.2	12.4	73	17.8	51.4	29.8	21.80	10.35	3.71	1.98	12.4
10-20	7.0	6.8	0	1.50	7.82	2.6	86	681	-	4.2	10.4	95	18.5	45.4	27.9	18.37	10.06	3.98	1.64	14.3
20-50	7.3	7.0	<0.1	1.23	6.11	1.5	60	560	-	3.1	3.7	69	6.0	4.0	28.6	12.13	9.15	5.13	1.24	17.9
50-100	7.9	7.5	<0.1	1.07	4.88	1.4	27	566	-	2.8	2.8	35	5.7	1.4	29.0	12.76	9.64	5.88	1.38	20.3
100-150	7.9	7.4	<0.1	0.70	3.55	1.1	15	556	-	2.8	2.6	29	6.3	1.3	26.4	12.85	8.68	5.31	1.30	20.1
150-200	7.8	7.3	<0.1	0.59	2.93	0.8	8	519	-	2.6	2.2	19	8.3	0.8	23.5	10.08	7.67	4.66	1.13	19.8

Note: Row sample bulked from 20 cores (0-10 cm) taken from along the rows near the pit.
CEC (cation exchange capacity) is 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.

Further information: DEWNR Soil and Land Program