

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 sheet: 6727-3 (Alexandrina) Hundred: Bremer
- Annual rainfall: 390 mm Sampling date: 18/08/93
- Landform: River terrace, at foot of levee adjacent to the Bremer River
- Surface: Seasonally cracking. Water table (5,000 ppm) at 160 cm, Dec. 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 Vertisol; 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.

Water holding 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 ₂ O	pH CaCl ₂	CaCO ₃ %	EC1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	SO ₄ -S 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.