

## BROWN CLAY

**General Description:** *Dark brown to black clay, becoming brown and grey mottled and weakly calcareous with depth. These soils may be less than a metre deep overlying older soils or sediments*

**Landform:** Alluvial flats and plains associated with the Bremer and Angas Rivers

**Substrate:** Variable Recent alluvium or older fine grained sediments

**Vegetation:** Blue gum / red gum woodland



**Type Site:** Site No.: CH053

1:50,000 sheet:	6727-3 (Alexandrina)	Hundred:	Freeling
Annual rainfall:	380 mm	Sampling date:	18/08/93
Landform:	Alluvial plain of the Bremer River, 0% slope		
Surface:	Hard setting, no stones		

### Soil Description:

Depth (cm)	Description
0-12	Very dark grey brown light medium clay with strong granular structure. Clear to:
12-27	Black medium clay with strong polyhedral structure. Clear to:
27-40	Dark yellow brown and dark grey brown mottled heavy clay with strong polyhedral structure. Gradual to:
40-65	Dark brown and brown mottled heavy clay with strong polyhedral structure. Gradual to:
65-115	Brown, dark brown and red mottled calcareous heavy clay with polyhedral structure and minor carbonate nodules. Gradual to:
	Older, unrelated sediment
115-180	Yellow, brown and orange mottled hard sandy clay with weak coarse prismatic structure and minor carbonate nodules.



**Classification:** Melanic-Sodic, Calcic, Brown Dermosol; medium, non-gravelly, clayey / clayey, deep

## Summary of Properties

<b>Drainage</b>	The soil is moderately well to imperfectly drained. It may remain wet for a week to several weeks, due to its high clay content.
<b>Fertility</b>	The natural fertility is high (indicated by the high base status), as are the phosphorus and organic carbon levels.
<b>pH</b>	Neutral at the surface, alkaline with depth.
<b>Rooting depth</b>	115 cm in the pit, mostly concentrated in the upper 40 cm.
<b>Barriers to root growth</b>	
<b>Physical:</b>	The high strength of the clay may restrict growth in some rootstock varieties.
<b>Chemical:</b>	There are no apparent chemical barriers to root growth, although low quality irrigation water will cause salts and exchangeable sodium to accumulate over time.
<b>Water holding capacity</b>	150 mm (very high), but not all is available due to uneven root distribution.
<b>Seedling emergence</b>	Moderate, depending on the organic matter status and dispersiveness of the surface. Cracking and surface sealing are problems on these soils.
<b>Workability</b>	Moderate to good. Organic carbon levels must be maintained at about 2% and / or gypsum is required to enable non-destructive working of this soil.

## Erosion Potential

<b>Water:</b>	Low.
<b>Wind:</b>	Low.

## Laboratory Data

Depth cm	pH H <sub>2</sub> O	pH CaCl <sub>2</sub>	CaCO <sub>3</sub> %	EC1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	SO <sub>4</sub> -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	
Paddock	7.1	6.8	0	0.28	1.43	2.8	49	672	-	3.0	11.2	47	20.3	14.5	25.9	23.94	6.35	1.24	1.73	4.8
0-12	7.5	7.1	0.1	0.24	1.31	3.0	50	758	-	2.9	14.5	45	24.9	14.8	26.6	18.42	7.02	1.41	1.72	5.3
12-27	7.7	7.0	<0.1	0.14	0.78	2.2	15	422	-	2.3	2.7	34	17.3	2.1	21.0	16.02	5.78	1.46	0.78	7.0
27-40	7.8	7.0	<0.1	0.16	0.90	0.7	5	333	-	2.1	2.0	27	11.1	0.2	22.9	13.13	6.67	2.09	0.69	9.1
40-65	7.9	7.2	<0.1	0.22	0.94	0.5	5	382	-	2.6	2.3	22	11.3	0.2	26.0	14.04	8.25	2.65	0.83	10.2
65-115	8.4	8.0	3.8	0.39	1.75	0.1	<4	346	-	2.3	1.1	11	3.2	0.1	17.7	10.57	6.50	2.27	0.66	12.8
115-180	8.5	8.0	1.6	0.46	3.17	0.1	<4	266	-	2.1	0.5	7	1.5	0.1	12.1	7.26	4.89	1.95	0.52	16.1

**Note:** Paddock sample bulked from 20 cores (0-10 cm) taken around 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.