

GREY CRACKING CLAY

General Description: *Hard grey clay, seasonally cracking, grading to a very coarsely structured hard grey, brown and red heavy clay, calcareous with depth*

Landform: Undulating rises.

Substrate: Heavy coarsely structured clay (old glacial valley infill).

Vegetation: Eucalyptus cneorifolia.



Type Site: Site No.: CK002

1:50,000 sheet:	6426-4 (Kingscote)	Hundred:	Menzies
Annual rainfall:	450 mm	Sampling date:	08/03/93
Landform:	Upper slope of gently undulating rise, 1% slope		
Surface:	Hard, seasonally cracking with no stones		

Soil Description:

<i>Depth (cm)</i>	<i>Description</i>
0-8	Very dark grey very hard medium clay with weak coarse prismatic structure and 2-10% quartzite fragments. Abrupt to:
8-25	Yellowish brown with olive grey and brown mottles very hard heavy clay with coarse polyhedral structure and quartzite fragments. Clear to:
25-45	Olive grey with yellowish brown and olive brown mottles, moderately calcareous very hard heavy clay with coarse polyhedral structure and 20-50% soft carbonate segregations. Gradual to:
45-75	Light olive grey with reddish brown mottles, moderately calcareous medium heavy clay with coarse prismatic structure and 10-20% soft carbonate segregations. Gradual to:
75-145	Pale olive with brownish yellow mottles very hard heavy clay with coarse lenticular structure and less than 2% soft carbonate segregations.



Classification: Epihypersodic-Endocalcareous, Massive, Grey Vertisol; slightly gravelly, fine/very fine, moderate

Summary of Properties

Drainage Imperfectly to poorly drained, due to the high clay content. The soil may remain wet for several weeks to some months following heavy or prolonged rainfall.

Fertility Natural fertility is high, as indicated by the exchangeable cation data. Levels of phosphorus, potassium and trace elements are adequate in surface soil, although zinc concentrations are marginal. Organic carbon levels are slightly low.

pH Neutral to slightly acidic in surface, alkaline at depth.

Rooting depth 80 cm in pit.

Barriers to root growth

Physical: Poor soil structure, caused by the very tight clay limits the volume of root growth, so low densities are likely.

Chemical: Subsoil zinc deficiency may reduce root growth. High boron and sodicity levels from 45 cm will also restrict roots.

Water holding capacity Approximately 120 mm in the root zone, but only about 100 mm effectively available due to low root density. Soil has a very high wilting point, which causes water to be withheld in a dry season.

Seedling emergence: Fair due to hard surface which tends to seal over.

Workability: Fair to poor due to strength of clay, and narrow moisture range for effective working. Surface becomes intractable when wet.

Erosion Potential

Water: Low.

Wind: Low.

Laboratory Data

Depth cm	pH H ₂ O	pH CaCl ₂	CO 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	
Paddock	7.2	7.0	1	0.29	1.44	1.6	31	430	-	2.4	0.8	77	9.8	0.3	21.1	15.8	4.50	0.90	1.23	4.3
0-8	5.9	5.5	1	0.14	0.73	2.1	36	340	-	2.0	1.2	320	11.1	0.3	20.5	13.0	3.80	0.33	1.01	1.6
8-25	8.1	7.7	2	0.21	0.39	0.22	<2	560	-	3.9	0.4	26	1.3	0.1	26.0	15.1	7.10	0.63	2.01	2.4
25-45	8.6	8.0	16	0.24	0.45	0.19	<2	590	-	4.0	0.4	25	1.4	<0.1	23.9	12.2	7.82	1.05	1.53	4.4
45-75	9.2	8.6	6	0.96	2.76	0.05	7	780	-	15.2	0.3	15	1.1	<0.1	24.3	4.22	12.8	6.38	1.87	26.3
75-145	9.2	8.8	2	1.92	4.77	0.02	<2	750	-	16.0	0.3	16	0.4	<0.1	28.0	2.02	13.0	11.9	1.82	42.6

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