

BLACK CRACKING CLAY

General Description: *Black cracking clay, with strong fine structure at the surface grading to coarse blocky structure with depth, containing variable soft carbonate throughout and formed over grey - green heavy clay*

Landform: Very gently undulating to flat plains

Substrate: Pleistocene age heavy clay with strongly developed slickensides

Vegetation: Grassland



Type Site: Site No.: CH095

1:50,000 sheet:	6627-4 (Noarlunga)	Hundred:	Willunga
Annual rainfall:	600 mm	Sampling date:	29/04/96
Landform:	Very gently undulating plain, 1% slope		
Surface:	Self-mulching and seasonally cracking with no stones		

Soil Description:

Depth (cm)	Description
0-10	Black highly calcareous medium clay with moderate granular structure. Clear to:
10-30	Black slightly calcareous heavy clay with strong polyhedral structure. Clear to:
30-70	Black slightly calcareous heavy clay with coarse prismatic structure and slickensides. Gradual to:
70-100	Black highly calcareous heavy clay with coarse prismatic structure, slickensides and 2-10% soft carbonate segregations. Gradual to:
100-130	Light grey and black mottled highly calcareous heavy clay with coarse prismatic structure, slickensides and 10-20% soft carbonate segregations. Gradual to:
130-170	Grey, light brown and olive mottled highly calcareous heavy clay with coarse lenticular structure, slickensides and 2-10% soft carbonate segregations.



Classification: Epicalcareous-Endohypersodic, Self-mulching, Black Vertosol; non-gravelly, deep

Summary of Properties

Drainage Imperfectly drained. The clay has low permeability and once the cracks have closed, parts of the profile may remain wet for several weeks after prolonged rainfall.

Fertility Natural fertility is very high, as indicated by the exchangeable cation data. Zinc is commonly deficient on these soils. Manganese levels may also be low.

pH Alkaline at the surface, strongly alkaline with depth.

Rooting depth Root growth to 130 in pit.

Barriers to root growth

Physical: The coarse structural aggregates below 30 cm impede root growth, most of which occurs between the aggregates.

Chemical: Boron and exchangeable sodium levels are marginally high from 70 cm and toxic from 100 cm.

Water holding capacity Approximately 200 mm in root zone (extremely high), but only about 90 mm of this is readily available.

Seedling emergence: Good

Workability: Fair to good - surface becomes sticky 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 (EDTA)				CEC cmol (+)/kg	Exchangeable Cations cmol(+)/kg				ESP	
											Cu	Fe	Mn	Zn		Ca	Mg	Na	K		
Row	7.9	7.7	3.5	0.48	1.87	1.5	110	665	197	3.0	5.98	27.3	9.85	4.03	42.8	39.7	2.98	0.48	3.27	1.1	
											*6.2	*27	*3.4	*2.3							
0-10	7.6	7.5	2.1	2.04	2.94	1.7	170	701	1645	2.3	-	-	-	-	49.3	42.3	3.68	0.40	2.64	0.8	
10-30	7.8	7.6	0.6	0.64	2.39	1.1	8	275	430	1.8	-	-	-	-	34.3	31.0	4.77	0.50	0.95	1.5	
30-70	8.1	7.7	1.5	0.56	1.80	1.2	6	374	295	1.5	-	-	-	-	48.6	36.8	10.7	3.04	1.47	6.3	
70-100	8.8	8.1	7.7	0.66	1.75	0.8	5	395	220	4.0	-	-	-	-	45.6	25.4	13.7	8.38	1.59	18.4	
100-130	9.2	8.5	8.7	0.81	1.63	0.1	<4	364	198	15.7	-	-	-	-	42.5	15.7	14.1	14.2	1.37	33.4	
130-170	9.3	8.6	4.9	0.88	1.43	0.1	<4	343	147	27.0	-	-	-	-	46.7	14.0	13.9	16.6	1.09	35.7	

Note: Row sample bulked from 20 cores (0-10 cm) taken along the planting lines.

* DTPA trace element analyses for "row" sample.

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.