

SHALLOW BLACK CRACKING CLAY ON CALCRETE

General Description: *Black seasonally cracking calcareous clay over calcreted limestone at shallow depth*

Landform: Level lacustrine plain.

Substrate: Calcreted calcareous clay of the Padthaway Formation.

Vegetation: Blue gum (*Eucalyptus leucoxylon*).



Type Site: Site No.: SE031

1:50,000 sheet: 6924-2 (Lucindale)

Hundred: Joyce

Annual rainfall: 610 mm

Sampling date: 15/06/94

Landform: Flat plain

Surface: Cracking with 2-10% calcrete stone (60-200 mm). Water table at 115 cm, but rising to within 50 cm of the surface later in the season.

Soil Description:

Depth (cm)	Description
0-10	Black firm slightly calcareous light clay with strong polyhedral structure. Clear to:
10-20	Very dark grey firm moderately calcareous medium clay with strong polyhedral structure and minor hard carbonate fragments. Sharp to:
20-25	Very strongly cemented massive calcrete pan. Sharp to:
25-55	Dark grey firm highly calcareous medium clay with strong polyhedral structure and more than 50% hard carbonate nodules (2-60 mm).
55-115	Pale yellow and yellowish brown hard calcareous light medium clay (marl).
115-	Water table.



Classification: Melanic, Petrocalcic, Black Dermosol; moderate, slightly gravelly, clayey / clayey, very shallow

Summary of Properties

Drainage Poorly drained. The lower part of the soil remains wet for several months during winter / spring due to the shallow water table.

Fertility Inherent fertility is high, as indicated by the exchangeable cation data. High surface clay and organic matter contents provide ample nutrient retention capacity. Phosphorus concentrations are low, and calcium : magnesium ratio is high. Manganese deficiencies are possible due to the combined effects of high pH and prolonged waterlogging.

pH Alkaline throughout.

Rooting depth 95 cm in pit, but few roots below 55 cm.

Barriers to root growth

Physical: The calcrete impedes root growth, but is sufficiently thin and fractured that some roots can penetrate.

Chemical: The high carbonate content in a clayey matrix below the calcrete restricts root growth.

Water holding capacity Approximately 70 mm in the pit.

Seedling emergence: Fair. The clayey surface can seal over, reducing emergence percentages.

Workability: Fair to poor. The clayey surface becomes sticky and 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	8.1	7.5	8.8	0.24	0.82	5.0	17	391	11.4	2.1	-	-	-	-	28.1	26.81	3.96	0.29	1.82	1.0
0-10	8.0	7.4	6.3	0.32	1.32	5.4	17	399	17.8	2.0	-	-	-	-	33.5	30.76	3.70	0.33	1.87	1.0
10-20	8.1	7.6	15.2	0.26	1.33	2.1	7	239	10.7	1.4	-	-	-	-	27.2	26.01	3.45	0.27	1.25	1.0
20-25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25-55	8.5	7.7	32.7	0.17	0.51	0.8	2	269	5.9	2.5	-	-	-	-	22.8	15.31	6.55	0.32	1.40	1.4
55-95	8.6	7.8	57.3	0.19	0.84	0.1	2	239	7.3	1.2	-	-	-	-	14.4	7.82	6.56	0.51	0.85	3.5
95-115	8.7	7.9	55.5	0.18	0.68	0.1	5	185	7.3	0.9	-	-	-	-	11.1	6.27	5.12	0.42	0.52	3.8

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.