

## BLACK CRACKING CLAY

**General Description:** *Black well structured clay loam to clay, grading to a dark strongly structured clayey subsoil with fine to rubbly carbonate at shallow to moderate depth*

**Landform:** Level plains (corridors between ancient coastal ridges).

**Substrate:** Interbedded limestones and clays (Padthaway Formation), capped by carbonate rubble.

**Vegetation:**



<b>Type Site:</b>	Site No.:	SE008	1:50,000 sheet:	7023-2 (Penola)
	Hundred:	Comaum	Easting:	484200
	Section:	462	Northing:	5871000
	Sampling date:	12/10/92	Annual rainfall:	625 mm

Flat. Firm surface with no stones.

### Soil Description:

<i>Depth (cm)</i>	<i>Description</i>
0-15	Black firm medium clay with strong coarse lenticular breaking to polyhedral structure. Diffuse to:
15-30	Black and very dark greyish brown hard medium clay with strong medium polyhedral structure. Gradual to:
30-42	Very dark grey and olive brown friable (wet) light medium clay with strong medium polyhedral structure. Gradual to:
42-51	Very dark grey, olive grey and dark yellowish brown friable (wet) light medium clay with strong medium polyhedral structure. Abrupt to:
51-80	Olive brown, yellowish brown and yellowish red friable highly calcareous light clay with strong polyhedral structure and more than 50% carbonate nodules (6-60 mm) forming a weak rubbly pan.



**Classification:** Endocalcareous-Mottled, Epipedal, Black Vertosol; non-gravelly, medium fine / medium fine, moderate

## Summary of Properties

**Drainage** Imperfectly drained. Clayey profile and substrate impede water movement. Seasonal water table at moderately shallow depth exacerbates the problem. Profile may remain wet for several weeks following heavy or prolonged rainfall.

**Fertility** Inherent fertility is very high. The exchangeable cation data indicate very high nutrient retention capacity which is augmented by favourable organic matter levels. Calcium saturation is high. There are no apparent nutrient deficiencies (nitrogen not measured).

**pH** Slightly alkaline at the surface, alkaline in the calcareous rubble layer.

**Rooting depth** 51 cm in pit.

### Barriers to root growth

**Physical:** The rubbly carbonate pan restricts deeper root growth.

**Chemical:** There are no chemical barriers to root growth.

**Water holding capacity** Approximately 80 mm in the root zone.

**Seedling emergence:** Fair to good provided surface structure is maintained.

**Workability:** Fair. Soil becomes sticky and intractable when wet.

### Erosion Potential

**Water:** Low.

**Wind:** Low.

## Laboratory Data

Depth cm	pH H <sub>2</sub> O	pH CaCl <sub>2</sub>	CO <sub>3</sub> %	EC1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	SO <sub>4</sub> 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	
0-15	7.6	6.9	3.3	0.09	-	2.3	32	850	-	3.9	8.1	52	1.7	1.1	33.8	27.6	2.9	0.23	2.58	0.7
15-30	7.2	6.6	1.9	0.06	-	1.6	8.4	730	-	4.6	1.9	55	1.4	0.57	36.3	26.0	3.0	0.29	2.46	0.8
30-42	7.4	6.7	1.4	0.05	-	0.9	4.1	550	-	5.2	0.29	10	0.50	0.33	32.0	24.5	3.0	0.31	2.19	1.3
42-51	7.6	7.0	2.1	0.09	-	0.7	5.0	530	-	4.4	0.25	11	0.75	0.39	32.5	24.5	3.0	0.33	2.01	1.3
51-80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

**Note:** 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

## RED CLAY LOAM ON CALCRETED CALCARENITE

**General Description:** *Red loam to clay loam grading to a well structured red clay on limestone or calcrete at shallow to moderate depth*

**Landform:** Low ridges (old coastal dunes) separated by corridors (old lagoon floors).

**Substrate:** Calcreted calcarenite.

**Vegetation:**



<b>Type Site:</b>	Site No.:	SE009	1:50,000 sheet:	7023-2 (Penola)
	Hundred:	Comaum	Easting:	484800
	Section:	154	Northing:	5870850
	Sampling date:	12/10/92	Annual rainfall:	625 mm

Upper slope of low rise, 2% slope. Firm surface with 2-10% calcrete (20-60 mm).

### Soil Description:

<i>Depth (cm)</i>	<i>Description</i>
0-12	Dark reddish brown friable clay loam with strong fine polyhedral structure and 2-10% calcrete stones (6-200 mm). Gradual to:
12-31	Dark reddish brown friable clay loam with strong fine polyhedral structure and 20-50% calcrete fragments (60-200 mm). Gradual to:
31-37	Dark reddish brown friable light clay with strong fine polyhedral structure and 2-10% calcrete stones (6-200 mm). Sharp to:
37-140	Calcrete capped calcarenite.



**Classification:** Haplic, Petrocalcic, Red Dermosol; thick, slightly gravelly, clay loamy / clayey, shallow

## Summary of Properties

**Drainage** Soil is well drained and rarely remains saturated for more than a day or so following heavy or prolonged rainfall.

**Fertility** Inherent fertility is high, as indicated by the exchangeable cation data. High calcium saturation and organic matter levels augment fertility. There are no apparent nutrient deficiencies.

**pH** Alkaline throughout.

**Rooting depth** Some root penetration into calcrete, but most growth is in the upper 37 cm.

### Barriers to root growth

**Physical:** The calcrete cap on the calcarenite is an effective root barrier.

**Chemical:** There are no chemical barriers.

**Water holding capacity** Approximately 75 mm in the root zone.

**Seedling emergence:** Satisfactory.

**Workability:** Firm surface is easily worked.

### Erosion Potential

**Water:** Low.

**Wind:** Low.

## Laboratory Data

Depth cm	pH H <sub>2</sub> O	pH CaCl <sub>2</sub>	CO <sub>3</sub> %	EC1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	SO <sub>4</sub> 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	
0-12	8.0	7.4	3.0	0.12	-	2.1	29	350	-	2.1	6.1	9.7	16	1.6	25.6	21.5	1.6	0.19	0.94	0.7
12-31	8.1	7.4	1.8	0.12	-	1.2	6.4	140	-	2.1	0.25	12	11	0.78	21.3	20.3	0.8	0.36	0.46	1.7
31-37	8.3	7.7	19.0	0.15	-	2.2	8.6	70	-	1.0	0.22	18	11	0.42	24.7	23.1	0.6	0.47	0.34	1.9
37-140	8.8	7.8	96.2	0.09	0.24	<0.1	<4	28	-	0.6	0.4	1	1.3	0.2	1.1	1.92	0.08	0.14	0.06	na

**Note:** 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