

GREY CRACKING CLAY

General Description: *Grey massive to coarsely structured seasonally cracking clay, calcareous in some part of the upper 50 cm, grading to heavy clay substrate within 100 cm*

Landform: Gilgai plains and depressions.

Substrate: Tertiary heavy clay mantled by fine carbonates.

Vegetation: Mallee.



Type Site: Site No.: MO035

1:50,000 sheet: 6727-4 (Monarto) Hundred: Monarto
 Annual rainfall: 375 mm Sampling date: 1976
 Landform: Depression with gilgai micro relief. Pit is in gilgai hollow
 Surface: Hard setting and seasonally cracking with no stones

Soil Description:

Depth (cm)	Description
0-10	Dark grey massive friable highly calcareous sandy light clay. Clear change to:
10-31	Light grey and dark greyish brown mottled friable highly calcareous sandy light clay with weak prismatic structure and sporadic bleaching. Gradual change to:
31-50	Greyish brown and brownish yellow mottled hard highly calcareous sandy medium clay with strong angular blocky structure. Diffuse to:
50-90	Brownish yellow and greyish brown mottled calcareous hard sandy heavy clay with strong angular blocky structure. Diffuse to:
90-200	Yellowish brown and light brownish grey mottled hard sandy medium clay with strong angular blocky structure, vertical cracking and pockets of fine carbonate.



Classification: Epicalcareous-Endohypersodic, Massive, Grey Vertosol; non-gravelly, fine / fine, moderate

Summary of Properties

- Drainage:** Imperfectly to poorly drained. The combination of clayey profile texture, slowly permeable clayey substrate and low lying topographic position causes water to accumulate in the soil which may remain saturated for months during winter. The gilgai hollows may have standing water for similar periods in wet seasons.
- Fertility:** Inherent fertility is moderately high, and nutrient retention capacity is favourable, but free carbonate in the surface can induce deficiencies of copper and zinc. Concentrations of phosphorus and nitrogen are usually low.
- pH:** Alkaline throughout.
- Rooting depth:** Not recorded. Estimate 90 cm in pit, but with few roots extending below 30 cm.
- Barriers to root growth:**
- Physical:** The dense clay throughout the profile restricts proliferation, so while roots may grow, their distribution patterns prevent efficient water use.
- Chemical:** High sodicity, moderate salinity and probably high boron concentrations limit root growth. pH is usually high in the subsoil, but is relatively low at this site.
- Water holding capacity:** Approximately 60 mm in the root zone.
- Seedling emergence:** Fair. The poorly structured surface soil is prone to sealing, affecting establishment. Clayey soils have high wilting points, so emergence is delayed compared with adjacent coarser textured soils.
- Workability:** Fair to poor. The clayey surface tends to become sticky when wet. Once wet, this land may become effectively inaccessible for weeks or even months.

Erosion Potential

- Water:** Low.
- Wind:** Low.

Laboratory Data

Depth cm	Coarse sand %	Fine sand %	Silt %	Clay %	pH H ₂ O	CO ₃ %	EC 1:5 dS/m	Cl mg/kg	CEC cmol (+)/kg	Exchangeable Cations cmol(+)/kg				ESP
										Ca	Mg	Na	K	
0-10	25	28	4	28	8.7	8.2	0.14	<50	23	16.3	4.0	0.44	1.9	1.9
10-31	nd	nd	nd	nd	8.8	nd	0.14	98	nd	nd	nd	nd	nd	nd
31-50	19	16	2	40	9.1	13	0.37	430	21	11.1	6.4	2.7	1.0	12.9
50-90	26	21	2	36	9.1	5.2	0.82	1090	19	7.5	6.5	4.3	0.95	22.6
90-200	24	20	2	41	9.1	4.0	1.73	2640	19	5.8	6.7	6.9	0.99	36.3

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.