RED CRACKING CLAY

General Description: *Deep reddish brown cracking clay with variable soft carbonate segregations overlying a red coarsely structured heavy clay*

Landform: Upper slopes of undulating rises and low hills

Substrate: Red heavy clay of Pleistocene age (Hindmarsh Clay equivalent)

Vegetation: Grassland

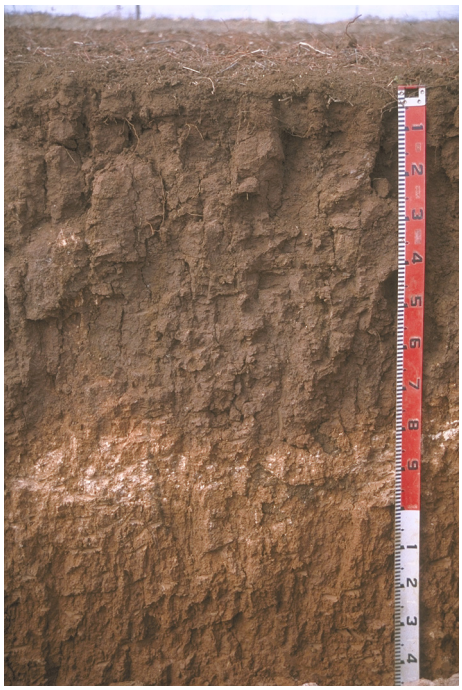
Type Site:

Site No.:	CM027	1:50,000 mapsheet:	6530-1 (Koolunga)
Hundred:	Hart	Easting:	264400
Section:	465	Northing:	6271300
Sampling date:	13/05/93	Annual rainfall:	495 mm average

Upper slope of an undulating low hill, with a slope of 3% and a strongly structured, cracking surface.

Soil Description:

Depth (cm)	*Description*
0-10	Dark reddish brown highly calcareous medium clay with blocky structure. Clear to:
10-40	Dark reddish brown highly calcareous heavy clay with strong coarse prismatic structure. Diffuse to:
40-75	Dark reddish brown moderately calcareous heavy clay with coarse prismatic structure. Clear to:
75-100	Red moderately calcareous medium heavy clay with moderate prismatic structure and 20-50% soft carbonate segregations (Class I carbonate). Gradual to:
100-160	Red moderately calcareous heavy clay with strong coarse blocky structure (Hindmarsh Clay equivalent).



Classification: Epicalcareous-Epihypersodic, Epipedal, Red Vertosol

Summary of Properties

Drainage: The soil is moderately well drained. The high clay content restricts water movement once the soil is wet, but waterlogging is only likely to be a problem in wet seasons. Saturation is unlikely for more than a week or so in most years.

Fertility: Natural fertility is very high as indicated by the exchangeable cation data. Potential productivity is very high provided that phosphorus levels are maintained (marginal at sampling site), organic carbon levels are near 2%, and zinc is applied to correct deficiencies which are common on this soil type.

pH: Alkaline at the surface, strongly alkaline with depth.

Rooting depth: There are few roots below 100 cm and these are confined to vertical biopores.

Barriers to root growth:

Physical: The high strength of the clay at low moisture content may be a minor limitation.

Chemical: Toxic levels of boron, high ESP, and high pH (inducing deficiencies of some elements) in the Class I carbonate layer restrict root growth below 75 cm.

Waterholding capacity: Approximately 150 mm in the rootzone. High clay content soils have high wilting points, so in some years this potential water storage may not fill. This can lead to premature finishes in dry seasons.

Seedling emergence: Good.

Workability: Fair. These soils become sticky and difficult to work if over-wet.

Erosion Potential:

Water: Moderately low. These soils have high natural resistance to erosion, but there is sufficient slope at the sampling site for erosion to occur.

Wind: Low.

Laboratory Data

Depth cm	pH H_2O	pH $CaCl_2$	CO_3 %	EC1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	SO_4 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	7.7	4.2	0.17	0.52	1.7	29	684	-	3.3	1.1	8	4.8	1.4	38.6	28.18	4.75	0.55	1.88	1.4
0-10	8.0	7.8	4.3	0.15	0.48	1.5	22	598	-	2.9	0.9	4	3.6	0.6	34.8	29.18	4.74	0.36	1.69	1.0
10-40	8.6	8.0	8.5	0.22	0.44	0.8	6	300	-	3.8	1.0	9	2.2	0.2	33.1	25.40	8.23	3.43	0.84	10.4
40-75	9.1	8.4	10.7	0.54	1.07	0.6	4	328	-	15.7	1.4	12	2.1	0.3	35.1	15.32	12.45	9.59	0.94	27.3
75-100	9.4	8.5	33.1	0.86	1.93	0.2	4	326	-	31.5	1.2	8	1.2	0.2	28.8	6.99	10.26	10.10	0.82	35.1
100-160	9.5	8.8	10.5	0.71	2.74	0.1	4	425	-	43.1	0.9	10	0.7	0.1	35.8	6.73	13.34	18.54	1.17	51.8

Note: Paddock sample bulked from 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.

Further information: DEWNR Soil and Land Program