CALCAREOUS CLAY LOAM

General Description: *Highly calcareous loam to clay loam, clay and carbonate content increasing to a Class III B carbonate layer which grades to a reddish heavy clay with coarse blocky structure and pockets of fine carbonate.*

Landform: Plains and gently undulating rises

Substrate: Coarsely structured clay of Pleistocene age (Hindmarsh Clay equivalent)

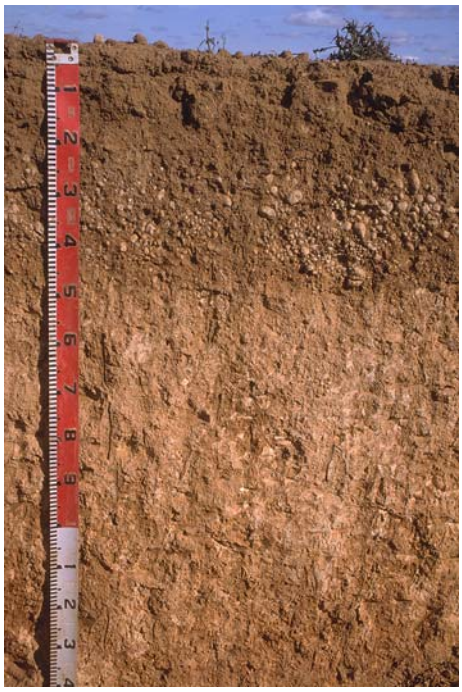
Vegetation: Mallee scrub

Type Site: Site No.: CM025

1:50,000 sheet:	6530-1 (Koolunga)	Hundred:	Boucaut
Annual rainfall:	350 mm	Sampling date:	13/05/93
Landform:	Flat plain with a 1% slope		
Surface:	Firm with no stones		

Soil Description:

Depth (cm)	*Description*
0-10	Dark red brown very highly calcareous clay loam with weak granular structure. Clear to:
10-23	Dark red brown very highly calcareous light clay with weak blocky structure. Clear to:
23-40	Red brown very highly calcareous light clay with about 50% calcrete nodules to 2 cm diameter (Class III B carbonate). Clear to:
40-70	Yellowish red very highly calcareous light clay with 20-50% soft carbonate segregations. Diffuse to:
70-105	Yellowish red very highly calcareous light clay with 20-50% soft carbonate segregations. Clear to:
105-160	Red moderately calcareous medium clay with strong prismatic structure and 20-50% soft carbonate segregations (Hindmarsh Clay equivalent).



Classification: Hypervescent, Regolithic, Supracalcic, Calcarosol; medium, non-gravelly, clay loamy / clayey, deep

Summary of Properties

Drainage The soil is well drained and is unlikely to remain wet for more than a day or so.

Fertility Inherent nutrient retention capacity is high as indicated by the exchangeable cation data, but the high carbonate content throughout limits availability of a range of nutrient elements - a characteristic feature of soils with very high reaction to acid to the surface. Phosphorus is low, and organic carbon level is typically high.

pH Alkaline at the surface, strongly alkaline with depth.

Rooting depth There are few roots below 70 cm, and most of these are confined to vertical biopores.

Barriers to root growth

Physical: There are no apparent physical barriers above the Hindmarsh Clay, the high strength of which restricts root growth.

Chemical: Toxic concentrations of boron (and possibly very high ESP) from 70 cm, and very high pH inducing nutrient deficiencies, combine to restrict root growth.

In many seasons, rainfall will be insufficient to wet the soil deeper than 70 cm.

Water holding capacity Approximately 100 mm in the root zone.

Seedling emergence Good.

Workability Good to fair. The soil has a limited moisture range for effective working (ie the surface changes from being too wet to too dry in a short period).

Erosion Potential

Water: Low.

Wind: Low, although these very highly calcareous soils are easily pulverized and therefore prone to erosion by excessive cultivation or grazing pressure.

Laboratory Data

Depth cm	pH H_2O	pH $CaC1_2$	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	9.5	0.18	0.72	1.5	22	881	-	2.8	0.9	4	7.8	0.9	24.7	17.73	3.02	0.16	2.05	0.6
0-10	8.1	7.8	9.1	0.19	1.00	1.5	19	881	-	2.7	0.9	4	8.3	0.5	24.0	17.69	3.02	0.17	2.10	0.7
10-23	8.3	7.8	13.5	0.14	0.36	0.7	8	548	-	3.0	1.1	5	2.8	0.2	24.6	17.80	3.70	0.28	1.43	1.1
23-40	8.7	8.0	19.8	0.16	0.36	0.5	7	264	-	4.0	1.0	4	2.3	0.2	20.5	14.21	4.64	0.98	0.55	4.8
40-70	9.4	8.2	45.2	0.38	1.19	0.1	8	274	-	14.6	1.0	5	1.4	0.1	15.0	5.85	6.10	3.35	0.58	22.3
70-105	9.7	8.6	43.0	0.92	4.43	0.1	7	381	-	38.7	0.5	3	0.9	0.1	15.7	3.00	7.39	6.29	0.87	40.1
105-160	9.6	8.6	34.8	1.22	5.99	0.1	6	436	-	39.3	0.4	4	0.8	0.1	18.2	3.16	7.87	7.48	1.02	41.1

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.