

SAND OVER ACIDIC CLAY

General Description: *Thick sandy surface soil, bleached with ortstein (coffee rock) nodules at base, overlying a yellow, brown and red clay subsoil grading to soft red, yellow and grey sandstone.*

Landform: Slopes of undulating rises and low hills in the floors of ancient glacial valleys

Substrate: Soft massive sandstone

Vegetation: Eucalyptus baxteri / E. cosmophylla / E. fasciculosa scrub



Type Site: Site No.: CH018

1:50,000 sheet:	6526-1 (Torrens Vale)	Hundred:	Encounter Bay
Annual rainfall:	750 mm	Sampling date:	29/07/92
Landform:	Midslope of an undulating rise, slope 7%		
Surface:	Soft with a trace of ironstone		

Soil Description:

Depth (cm)	Description
0-20	Dark grey soft loamy sand. Abrupt to:
20-32	Very pale brown soft sand. Clear to:
32-40	Yellowish brown soft loamy sand with 10% ortstein nodules. Abrupt to:
40-65	Yellowish brown, brown and red medium clay with strong polyhedral structure. Gradual to:
65-120	Yellowish brown, pale yellow and red fine sandy light clay with moderate blocky structure. Diffuse to:
120-180	Brownish yellow, pale yellow and red fine sandy clay loam with weak blocky structure (weathered sandstone).



Classification: Bleached, Mesotrophic, Brown Kurosol; thick, non-gravelly, sandy / clayey, deep

Summary of Properties

Drainage	Well drained. soil is unlikely to remain wet for more than about a week.
Fertility	Natural fertility is low, as indicated by the low CEC. This is due to the low clay content of the surface and the mineralogy of the clay in the subsoil. Levels of surface phosphorus, calcium, magnesium, potassium, sulphur and boron are low, but there is significant subsurface accumulation caused by leaching. Copper, manganese and iron also appear to be low. Leaching losses of nutrients are exacerbated by the acidity of the soil. Maintenance of neutral pH is critical for the fertility of this soil.
pH	Acidic in surface, strongly acidic in subsoil, causing marginal aluminium toxicity, molybdenum deficiency and poor legume nodulation. Dolomitic lime is required.
Rooting depth	120 cm at type site, but roots below 65 cm are confined to sand filled cracks.
Barriers to root growth	
Physical:	None.
Chemical:	Low pH (with possible aluminium toxicity) and low nutrient status.
Water holding capacity	150 mm in root zone (high), but only about 100 mm of this is available because of low root density below 65 cm.
Seedling emergence	Good, except where water repellence occurs.
Workability	Good.
Erosion Potential	
Water:	Moderately low due to thick, highly permeable surface soil.
Wind:	Moderate, due to loose sandy surface.

Laboratory Data

Depth cm	pH H ₂ O	pH CaCl ₂	CaCO 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	Ext Al mg/kg
											Cu	Fe	Mn	Zn		Ca	Mg	Na	K		
Paddock	5.4	4.8	0	0.05	0.27	2.7	6	58	5.4	0.3	0.7	49	4.9	3.8	3.9	2.5	0.8	<0.1	0.15	na	2
											*1.1	*62	*14	*4.4							
0-20	5.1	4.4	0	0.04	0.13	1.2	<2	9	2.6	0.3	0.5	35	0.8	1.1	3.3	1.4	0.4	<0.1	0.05	na	2
20-32	4.9	4.3	0	0.03	0.08	0.2	20	17	1.1	0.5	0.2	65	<0.1	0.1	1.5	<0.4	<0.2	<0.1	0.05	na	2
32-40	4.9	4.3	0	0.04	0.09	0.6	100	83	1.6	0.4	0.3	206	0.1	0.2	2.9	0.7	0.3	<0.1	0.20	na	7
40-65	5.1	4.6	0	0.05	0.08	0.2	5	120	19	1.2	<0.1	10	<0.1	<0.1	6.3	2.2	2.7	0.12	0.32	1.9	<1
65-120	5.3	4.9	0	0.05	0.12	0.1	<2	41	22	1.0	<0.1	4	<0.1	<0.1	4.5	1.2	2.9	0.11	0.12	2.4	<1
120-180	5.0	4.4	0	0.04	0.12	0.1	<2	26	17	0.7	<0.1	4	<0.1	<0.1	3.3	1.1	2.3	0.13	0.11	na	1

Note: Paddock sample bulked from 20 cores (0-10 cm) taken around the pit.

* EDTA trace element analyses for "paddock" sample.

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.