

THICK HIGHLY LEACHED SAND OVER BROWN CLAY

General Description: *Thick highly leached acid sand (clay spread at surface) over poorly structured brown clay becoming mottled with depth. Thin iron organic layer on sand/clay boundary.*

Landform: Poorly drained plain with very slight undulations.

Substrate: Mottled clays of the Padthaway Formation.

Vegetation: Brown stringybark (*Eucalyptus. baxteri*), yakka (*Xanthorrhoea Sp*)



Type Site: Site No.: SE102

1:50,000 sheet:	7023-3(Monbulla)	Hundred:	Monbulla
Annual rainfall:	700 mm	Sampling date:	18/07/05
Landform:	Very gently undulating plain		
Surface:	Soft with no stones		

Soil Description:

Depth (cm)	Description
0-10	Black single grain loamy sand with lumps of brown medium clay (from clay spreading). Clear to:
10-18	Very dark grey single grain sand. Gradual to:
18-30	Dark grey single grain sand. Diffuse to:
30-43	Grey single grain sand. Clear to:
43-52	Pinkish grey (bleached when dry) single grain sand. Sharp to:
52-61	Dark brown massive firm loamy sand with elevated organic carbon and very high iron content. Abrupt to:
61-95	Strong brown medium heavy clay with strong coarse polyhedral structure. Clear to:
95-140	Strong brown and white mottled massive medium heavy clay.



Classification: Fragic, Humosesquic, Semiaquic Podsol; medium, non-gravelly, sandy / sandy, moderate

Summary of Properties

Drainage: The sandy upper part of the profile is highly permeable, but water perches on top of the clay from 60 cm. The clay becomes moderately waterlogged and is slow to drain. Drainage is further restricted by the low flat topography.

Fertility: Inherent fertility is very low at the surface. However clay spreading at 250 tonnes per hectare has increased this when the data are compared with an untreated soil (refer to Site SE103). Phosphorus levels are adequate for pasture and can be related to the retention capacity supplied by the added clay. Potassium status is very low until the clay layer is reached. Sulphur is adequate at the surface. Trace copper, zinc and manganese are low. Organic carbon is high, probably relating to the infertile, acid conditions and subsequent low microbial activity.

pH: Acidic throughout; strongly acidic to 43cm.

Rooting depth: 95cm in pit, but few roots below 43cm.

Barriers to root growth:

Physical: No physical barriers until the massive clay at 95 cm.

Chemical: Very low nutrient levels below 10cm, and lower again below 18cm, may impede root development. Soil acidity is also likely to be an impediment. Aluminium reaches moderately high levels at 52cm.

Water holding capacity: 65 mm in total root zone; 25 mm in zone to 43 cm.

Seedling emergence: Clay spreading should alleviate any water repellence problems.

Workability: Sandy surfaces are easily worked.

Erosion Potential

Water: Low

Wind: Moderate potential if surface vegetation cover is not maintained.

Laboratory Data

Depth cm	pH H ₂ O	pH CaCl ₂	NO ₃ mg/kg	EC 1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	Cl mg/kg	SO ₄ -S mg/kg	Boron mg/kg	Trace Elements mg/kg (EDTA)				Sum cations cmol (+)/kg	Exchangeable Cations cmol(+)/kg				Exch Al
												Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
0-10	5.0	4.4	56	0.17	1.79	3.61	37	42	17	18.1	0.5	0.19	67	6.17	1.07	6.5	5.51	0.73	0.11	0.11	0.08
10-18	5.2	4.1	2	0.03	0.19	1.50	4	15	4	3.8	0.2	0.14	61	0.22	0.30	2.5	2.14	0.28	0.05	0.04	0.08
18-30	5.0	4.2	1	0.02	0.16	0.67	2	15	2	2.5	0.2	0.0	19	0.17	0.07	0.8	0.63	0.09	0.03	0.03	0.07
30-43	5.0	4.3	1	0.01	0.14	0.32	2	15	2	1.6	0.3	0.06	17	0.46	<.05	0.3	0.21	0.04	0.02	0.03	0.05
43-52	6.0	5.2	4	0.02	0.22	0.12	3	15	4	1.7	0.1	0.07	16	<0.1	0.12	0.3	0.14	0.03	0.05	0.03	0.02
52-61	5.3	4.7	10	0.03	0.56	0.76	29	17	12	3.0	0.3	0.08	323	0.61	0.15	2.1	1.70	0.23	0.08	0.06	0.23
61-95	5.9	4.8	3	0.03	0.14	0.53	2	147	10	6.2	0.9	0.06	54	0.22	<.05	10.5	6.98	2.95	0.22	0.38	0.18
95-140	6.4	5.7	1	0.04	0.20	0.18	2	127	8	17.6	0.6	0.15	16	0.67	0.16	9.4	6.90	1.96	0.22	0.33	0.00

Note: Sum of cations, in a neutral to alkaline soil, approximates the CEC (cation exchange capacity), but this approximation is invalid in this acidic soils due to unknown levels of exchangeable hydrogen.