

THICK ACIDIC SAND OVER MOTTLED BROWN CLAY

General Description: *Thick bleached coarse sand over mottled and poorly structured brown clay; clay delved*

Landform: Slightly undulating plain at the foot of Mt. Muirhead.

Substrate: Clayey Padthaway sediments, possibly with influence from nearby Bridgewater Formation (sands).

Vegetation: Originally brown stringy bark (*Eucalyptus baxteri*) woodland.



Type Site:	Site No.:	SE107C	1:50,000 mapsheet:	6922-1 (Millicent)
	Hundred:	Mt. Muirhead	Easting:	446860
	Section:	115	Northing:	5843700
	Sampling date:	15/07/2009	Annual rainfall:	750 mm average

Lower slope of low rise on gently undulating plain. Paddock recently delved into top of subsoil.

Soil Description:

<i>Depth (cm)</i>	<i>Description</i>
0-15	Very dark grey soft loose single grain organic sand, with clay lumps. Many roots. Abrupt to:
15-25	Very dark grey soft loose single grained organic sand. Many roots. Clear to:
25-35	Bleached grey massive sand. Roots few to common. Diffuse to:
35-50	Bleached grey brown massive sand. Roots few to common. Sharp to:
50-65	Hard brown and yellowish brown sandy medium clay with very coarse columnar structure, breaking to weak medium subangular blocky. Roots common. Diffuse to:
65-90	Hard light brownish grey, olive yellow and red sandy medium heavy clay with very coarse prismatic structure. Roots common. Diffuse to:
90-115	Hard light brownish grey and olive yellow sandy medium heavy clay with strong very coarse prismatic structure. Roots few to common. Diffuse to:
115-150	Hard pale olive and brownish yellow sandy medium heavy clay with strong very coarse prismatic structure. Roots few to common.



Classification: Mesotrophic, Mottled-Subnatric, Brown Sodosol; thick, non-gravelly, sandy/clayey, deep



Summary of Properties

- Drainage:** Imperfectly drained. Excessively drained in the surface horizons, leading to rapid nutrient leaching. Water perches on the surface of the subsoil clay, saturating the lower topsoil and upper subsoil (layers 4 and 5) for periods of up to several weeks following heavy or prolonged rainfall. The delve lines concentrate water movement, with active seepage along delve lines observed. Coarse columnar structure in the subsoil results in very slow, strongly preferential and uneven drainage.
- Fertility:** The surface soil has low inherent fertility, as indicated by the sum of cations. The bleached subsurface is significantly less fertile again. The clayey subsoil has high nutrient retention capacity. Clay delving has significantly increased the potential for the surface soil to retain nutrients (although capacity is still low).
- pH:** Strongly acidic to 50cm, moderately acidic in the subsoil.
- Rooting depth:** 150 cm.
- Barriers to root growth:**
- Physical:** Dense and infertile bleached subsurface restricts root abundance. This impact is greatly reduced in the delve zone. The hard coarsely structured dispersive subsoil confines most root growth to the surfaces of the aggregates, resulting in poor root distribution patterns.
- Chemical:** Low pH, high aluminium, very low fertility and sodicity may impede root growth in sensitive species.
- Waterholding capacity:** Approximately 120 mm in the rootzone, but not all available due to poor root distribution in clay subsoil.
- Seedling emergence:** Fair to good. Clay at the surface will overcome water repellence. Some areas of high clay concentration may be hardsetting.
- Workability:** Good
- Erosion Potential**
- Water:** Low.
- Wind:** Moderate if surface vegetative cover is removed. Surface clay lumps reduce risk.

Laboratory Data

Depth cm	pH H ₂ O	pH CaCl ₂	CO ₃ %	EC 1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	NO ₃ + NH ₄ mg/kg	React Fe mg/kg	Cl mg/kg	SO ₄ -S mg/kg	Ext Al mg/kg	Boron mg/kg	Trace Elements mg/kg (DTPA)				Sum cations cmol (+)/kg	Exchangeable Cations cmol(+)/kg				Est ESP
															Cu	Fe	Zn	Mn		Ca	Mg	Na	K	
0-15	5.2	4.2	0	0.038	0.30	2.24	27	83	11	843	5	3.4	4.5	0.3	0.6	235	1.52	3.85	3.6	2.34	0.63	0.12	0.2	3.3
15-25	4.9	4.1	0	0.032	0.42	1.53	32	55	11	683	8	3.5	9.8	0.2	0.43	342	1.37	1.37	2.4	1.32	0.27	0.10	0.13	na
25-35	4.9	4.5	0	0.055	0.80	0.24	22	33	17	346	24	2.6	8.4	0.1	0.08	108	0.76	0.34	1.2	0.54	0.12	0.13	0.05	na
25-35*	4.9	4.2	0	0.045	0.45	0.84	37	40	7	828	24	3.3	11.7	0.2	0.21	253	0.66	0.74	2.5	1.42	0.34	0.12	0.09	na
35-50	5.5	4.9	0	0.041	0.56	0.09	5	31	8	194	28	2.2	4.5	0.0	0.08	61.6	0.69	0.28	1.1	0.60	0.19	0.13	0.09	na
35-50*	5.4	4.6	0	0.023	0.25	0.26	9	30	4	399	11	1.8	7.5	0.2	0.16	134	0.71	0.24	1.5	0.88	0.22	0.08	0.06	na
25-50+	5.7	4.7	0	0.047	0.44	0.58	4	108	6	4809	28	3.6	3.5	0.6	0.07	209	0.68	0.3	13.9	7.05	5.39	0.69	0.29	5.0
50-65	5.9	4.9	0	0.044	0.50	0.51	2	117	1	3238	26	3.7	1.7	0.5	0.12	143	0.62	0.32	17.3	8.49	6.97	1.16	0.34	6.7
65-90	6.2	5.2	0	0.073	0.40	0.24	2	170	1	1104	38	7.2	0.5	0.9	0.07	41.4	0.89	0.14	21.4	7.87	11.1	1.80	0.47	8.4
90-115	7.1	6.1	0	0.124	0.51	0.15	2	235	1	956	47	24.6	0	3.0	0.07	20.9	0.64	0.17	34.2	14.4	14.9	4.19	0.68	12.2
115-	7.9	6.9	0	0.118	0.66	0.08	2	184	1	744	64	17.6	0	2.9	0.12	17.1	1.29	0.47	26.5	10.5	12.3	3.20	0.53	12.1

*A1 and A2 sand mixed through delving

+Delved clay (from B21) in the A2 horizon.

Note: Sum of cations, in a neutral to alkaline soil, approximates the CEC (cation exchange capacity), 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](#)

