

SHALLOW SAND OVER CLAY ON CALCRETE

General Description: *Delved grey sand with a bleached subsurface over weakly structured brown clay subsoil, over calcreted lagoonal sediments.*

Landform: Level plain.

Substrate: Calcreted limestone of the Padthaway Formation

Vegetation:



Type Site:	Site No.:	SE119	1:50,000 mapsheet:	7025-4 (Cannawigara)
	Hundred:	Pendleton	Easting:	459690
	Section:	49	Northing:	6001250
	Sampling date:	06/11/06	Annual rainfall:	480 mm average

Level plain, 0% slope. Soft surface with minor calcrete stones. Paddock delved to 40 cm.

Soil Description:

<i>Depth (cm)</i>	<i>Description</i>
0-15	Very dark grey brown single grain clayey sand with 10-20% small clay fragments and 2-10% calcrete fragments. Many roots. Clear to:
15-25	Very pale brown (bleached) single grain sand. Few roots. Abrupt to:
25-38	Strong brown friable weakly subangular blocky light medium clay. Roots common. Sharp to:
38-64	White calcreted limestone. An occasional root present. Diffuse to:
64-115	White calcreted limestone. An occasional root present. Diffuse to:
115-150	Massive light grey medium clay with brownish yellow mottle. Interspersed with up to 50% soft carbonate. No roots.



Note: Clay delving has caused mixing of the first three, (and occasionally part of the fourth) layers where the delve tine has passed.

Classification: Eutrophic, Petrocalcic, Brown Sodosol; medium, slightly gravelly, sandy / clayey, shallow



Summary of Properties

Drainage:	Well drained. No part of the profile is likely to remain wet for more than a day or so.
Fertility:	Clay delving has improved the fertility of the soil surface, with cation data indicating moderate inherent fertility – natural fertility of this soil is low. Fertility has also been improved in the second layer along the delve line. Phosphorus levels are low, but most other nutrients appear adequate for pasture growth. Surface levels of cobalt, molybdenum and nickel were 1007, 154 and 2118 parts per billion respectively.
pH:	Alkaline throughout – surface alkalinity attributable to irrigation water
Rooting depth:	64 cm in the sampling pit. Rootzones of soils formed over limestone are usually variable due to the dissolution of the limestone. Deeper solution holes (up to 100 cm) evident during excavation. Very low root numbers in small clay filled holes in calcreted limestone.
Barriers to root growth:	
Physical:	The cemented platy pan of calcreted limestone restricts root penetration.
Chemical:	High pH and high carbonate of limestone prevents most roots from accessing these horizons. The soil is moderately saline, becoming highly saline below 25 cm. The soil is strongly sodic, particularly in the third layer.
Waterholding capacity:	Total available water: Estimate 30-60 mm Readily available water (RAW): Estimate 15-30 mm. The influence of the limestone layer on water availability is unknown.
Seedling emergence:	Good. The clay spread at the surface through the delving process has improved the surface condition and reduced water repellence.
Workability:	Good.
Erosion Potential:	
Water:	Low.
Wind:	Moderate if surface vegetation cover is removed and the surface is allowed to dry out.

Laboratory Data

Depth cm	pH H ₂ O	pH CaCl ₂	CO ₃ %	EC 1:5 dS/m	ECe dS/m	Cl mg/kg	Org.C %	Avail. P mg/kg	Avail. K mg/kg	SO ₄ -S mg/kg	Boron mg/kg	React Fe mg/kg	Trace Elements mg/kg (EDTA)				Sum cations cmol (+)/kg	Exchangeable Cations cmol(+)/kg				Est. ESP
													Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
0-15	8.6	8.1	1	0.44	4.57	385	1.77	15	166	32.5	1.7	326	2.65	132	16.9	3.35	13.9	6.7	4.82	2.0	0.41	14.4
15-25	8.3	8.0	0	0.25	3.59	235	0.18	2	44	18.2	0.4	149	1.12	45	0.92	52.0	3.8	2.2	0.72	0.8	0.08	21.0
25-38	7.7	7.3	0	1.16	10.25	1395	0.94	2	307	98.3	1.1	902	1.55	91	2.95	0.76	25.1	12.1	5.22	6.84	0.94	27.2
38-64	8.5	8.1	79	2.01	14.03	2528	0.69	2	84	131	0.7	133	1.54	21	1.74	0.63	25.7	17.5	1.62	6.29	0.22	24.5
64-115	8.6	8.1	81	1.05	8.58	1259	0.37	2	136	22.2	0.6	224	1.53	20	1.88	0.59	19.7	16.1	1.36	1.89	0.35	9.6
115-150	9.1	8.2	6	0.25	1.39	198	0.14	2	271	11.2	0.5	376	1.68	23	3.13	0.7	27.6	16.9	8.59	1.39	0.74	5.0
15-40*	8.8	8.2	2	0.88	7.40	839	0.91	3	293	62.6	1.2	921	1.95	213	3.43	1.28	23.0	10.5	6.35	5.36	0.82	23.3
15-40**	8.9	8.2	1	0.43	5.43	469	0.68	4	65	27.6	0.5	266	5.45	145	6.07	5.1	9.5	6.0	1.57	1.69	0.16	17.9

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, in this case estimated by the sum of cations.

* Clay lumps sampled from within the zone altered by delving.

** Sand sampled from within the zone altered by delving.

Further information: [DEWNR Soil and Land Program](#)

