BLEACHED SAND OVER CLAY ON CALCRETE

General Description: *Delved thick bleached sand over poorly structured brown clay soil on calcreted limestone.*

Landform: Very gently undulating plain.

Substrate: Calcreted limestone of the Padthaway Formation.

Vegetation:

Type Site:

Site No.:	SE120	1:50,000 mapsheet:	7025-4 (Cannawigara)
Hundred:	Pendleton	Easting:	460600
Section:	49	Northing:	6001270
Sampling date:	06/11/06	Annual rainfall:	480 mm average

Flat on very gently undulating plain. Soft surface with no stones. Paddock delved to 50 cm. Irrigated lucerne.

Soil Description:

Depth (cm)	*Description*
0-10	Very dark grey brown weakly granular soft clayey sand with a 2-10% small (delved) clay fragments. Many roots. Clear to:
10-16	Brown soft sand. Roots common. Clear to:
16-30	Bleached single grain sand. Few roots. Sharp to:
30-50	Strong brown and dark brown mottled hard light clay with coarse columnar, breaking to medium angular blocky, structure. Roots few to common. Diffuse to:
50-70	Yellowish brown and dark brown mottled hard medium clay with coarse prismatic, breaking to medium angular blocky, structure. Roots few to common. Sharp to:
70-120	Light grey platy calcreted limestone with yellow mottles. Strongly cemented pan. Very few roots. Diffuse to:
120-150	Light grey and yellow mottled hard light clay with platy structure and more than 50% carbonate veins. No roots.

Note: Clay delving has caused mixing of the top four horizons along the line of delve tine.

Classification: Eutrophic, Petrocalcic, Brown Sodosol; thick, non-gravelly, sandy/clayey, moderate

Summary of Properties

Drainage: Moderately well drained. Water is likely to perch on top of the first clay horizon for several days. However, preferred pathways of drainage along soil columns will improve drainage of water into the more permeable limestone below.

Fertility: Clay delving has improved the fertility of the soil surface, with the exchangeable cation data indicating moderate inherent fertility. Fertility has also been improved in the second horizon along the delve line. Nutrient levels in the soil appear to be adequate for pasture growth.

pH: Moderately alkaline in the sandy surface horizons (due to effects of irrigation water), becoming slightly alkaline to neutral in the clay subsoil, and alkaline at depth.

Rooting depth: 70 cm in the pit, with a very few roots penetrating the calcreted limestone in small clay filled gaps.

Barriers to root growth:

Physical: The coarsely structured clay restricts root growth with low root densities inside the clay columns. The platy pans within the calcreted limestone presents a severe barrier to root penetration.

Chemical: The high pH and high carbonate of the calcreted limestone prevent most roots from accessing these horizons. The soil is moderately saline, with a bulge of high salinity in the first clay horizon. The soil is moderately to strongly sodic above 50 cm. The salinity and sodicity are largely due to irrigation water.

Waterholding capacity: Approximately 35 mm readily available water (RAW) in irrigable rootzone.
Approximately 70 mm total available water in potential rootzone.
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_2O	pH $CaCl_2$	CO_3 %	EC1:5 dS/m	ECe dS/m	Cl mg/kg	Org.C %	NO_3 + NH_4 mg/kg	Avail. P mg/kg	Avail. K mg/kg	SO_4-S mg/kg	React Fe mg/kg	Boron 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	
0-10	8.0	7.7	0	0.75	6.52	708	2.31	16	32	166	97.5	260	2.1	3.03	86	22.8	6.3	15.7	7.3	5.09	2.79	0.46	17.8
10-16	7.7	7.4	0	0.48	6.05	493	0.78	4	9	79	55.9	201	0.5	0.54	57	10.8	1.8	7.3	4.0	1.22	1.83	0.18	25.2
16-30	8.0	7.6	0	0.27	4.31	330	0.2	2	6	40	30.3	145	0.2	0.18	42	0.8	0.5	3.1	1.4	0.54	1.02	0.08	33.1
30-50	7.2	6.9	0	1.12	9.22	1229	0.66	2	2	584	125	885	1.4	0.95	41	1.1	0.4	23.1	12.0	4.37	5.23	1.56	22.6
50-70	7.2	6.9	0	0.84	5.82	908	0.53	2	2	363	42.0	861	1.0	1.11	50	1.4	0.4	27.7	18.5	5.86	2.25	1.05	8.1
70-120	8.8	7.9	58	0.19	0.84	67	0.25	6	2	183	11.8	399	0.8	1.10	18	1.2	0.4	18.2	15.9	1.36	0.50	0.47	2.7
120-150	8.9	8.0	38	0.16	0.69	38	0.18	4	2	188	15.5	373	0.5	1.18	16	1.7	0.5	20.1	14.9	4.15	0.52	0.51	2.6

Note: Sum of cations approximates the CEC (cation exchange capacity), however, the high salinity of this site may result in higher than actual values, particularly for sodium.

ESP (exchangeable sodium percentage) is derived by dividing the exchangeable sodium value by the CEC, in this case estimated by the sum of cations.

Further information: DEWNR Soil and Land Program