SAND OVER CLAY ON CALCRETE

General Description: *Soft sand with a bleached subsurface layer, sharply overlying a grey mottled columnar structured clay with fragmented or sheet calcrete at about 50 cm.*

Landform: Level to very gently undulating plains

Substrate: Calcreted limestones and clays of the Padthaway Formation (old lagoon bed deposits)

Vegetation:

Type Site:

Site No.:	SE904	1:50,000 mapsheet:	6925-4 (Laffer)
Hundred:	Laffer	Easting:	419050
Section:	11	Northing:	5999100
Sampling date:	26/11/03	Annual rainfall:	510 mm average

Flat on very gently undulating plain. Soft surface with no stones.

Soil Description:

Depth (cm)	*Description*
0-10	Very dark grey (10YR3/1) soft single grain sand. Clear to:
10-23	Light grey (10YR7/1) soft single grain sand. Sharp to:
23-42	Light brownish grey (2.5Y6/3), dark greyish brown (2.5Y4/2) and strong brown (7.5YR5/8) mottled firm medium clay with moderate coarse columnar structure and 2-10% calcrete fragments (60-200 mm). Clear to:
42-58	Light brownish grey (2.5Y6/2) firm very highly calcareous medium clay with weak subangular blocky structure, more than 50% soft very pale brown (10YR8/2) carbonate segregations and 20-50% calcrete fragments (2-6 mm). Sharp to:
58-60	Strongly cemented massive calcrete pan.

Classification: Hypercalcic, Mottled-Hypernatric, Grey Sodosol; medium, non-gravelly, sandy / clayey, moderate

Summary of Properties

Drainage: Imperfectly drained. The shallow watertable characteristic of this area prevents adequate drainage of water from the profile to the extent that at least the lower part of the soil is wet for several months each year.

Fertility: Inherent fertility is low, as indicated by the exchangeable cation data. This is due to low clay content and moderate to strong leaching. Points to note about this soil (in its natural state) are low phosphorus and very high potassium levels, moderately low copper and zinc levels, and extremely high concentrations of boron and sulphur. The latter two are linked to high salt levels.

pH: Alkaline at the surface, strongly alkaline with depth.

Rooting depth: 58 cm in pit, but few roots below 42 cm.

Barriers to root growth:

Physical: The poorly structured subsoil restricts root growth, confining most activity to the surfaces of the coarse aggregates. The calcrete also prevents uniform root distribution, although it is sufficiently fractured to allow some penetration.

Chemical: High salinity (and associated boron and chloride) throughout, and high alkalinity in the subsoil restrict species lacking salt tolerance.

Waterholding capacity: Approximately 50 mm in the potential rootzone (Moderately low).

Seedling emergence: Satisfactory, although water repellence may cause uneven establishment in some seasons.

Workability: The sandy surface is easily worked, although compaction is likely if worked too wet.

Erosion Potential:

Water: Low.

Wind: Moderately low.

Laboratory Data

Depth cm	pH H_2O	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	Trace Elements mg/kg (DTPA)				CEC cmol (+)/kg	Exchangeable Cations cmol(+)/kg			
												Cu	Fe	Zn	Mn		Ca	Mg	Na*	K
0-10	8.3	8.0	0	2.01	25.4	2846	0.75	5	230	151	19.9	0.11	3.1	0.28	1.64	nd	2.46	3.98	11.8	0.71
10-23	8.4	7.8	9	1.10	17.1	1161	0.13	<1	107	83.1	3.5	0.29	13	0.17	2.91	nd	0.23	0.80	3.92	0.22
23-42	9.5	9.0	2.5	2.46	18.9	2081	nd	4	1202	227	43	0.41	7.6	0.29	1.55	nd	4.27	5.09	17.0	3.36
42-58	9.5	8.6	48.3	2.71	24.2	2898	nd	3	708	239	16.5	0.22	5.0	0.77	2.34	nd	5.72	4.13	13.4	1.70
58-60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: CEC (cation exchange capacity) is a measure of the soil's capacity to store and release major nutrient elements.
* Extremely high values indicate that sample pre-treatment for soluble salts may have been inadequate.

Further information: DEWNR Soil and Land Program