

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.: SE905
1:50,000 sheet: 6925-4 (Laffer) Hundred: Laffer
Annual rainfall: 475 mm Sampling date: 26/11/03
Landform: Flat on very gently undulating plain
Surface: Soft with 2-10% calcrete stones (60-200 mm)

Soil Description:

Depth (cm)	Description
0-15	Brown (10YR4/3) soft single grain sand. Clear to:
15-25	Very pale brown (10YR8/2) soft single grain sand. Sharp to:
25-40	Light olive brown (2.5Y5/3) and dark greyish brown (2.5Y4/2) mottled firm medium clay with strong coarse columnar structure. Gradual to:
40-60	Light olive brown (2.5Y5/3) firm non calcareous medium clay with weak subangular blocky structure, 20-50% calcrete fragments (60-200 mm) and 10-20% soft carbonate segregations. Sharp to:
60-65	Strongly cemented massive calcrete pan.



Classification: Calcic, Mottled-Hypernatric, Brown Sodosol; medium, slightly gravelly, sandy / clayey, moderate

Summary of Properties

Drainage: Imperfectly drained. The shallow water table 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. Note accumulation of phosphorus in the subsoil. Copper, zinc and manganese are all deficient in the surface, but levels are satisfactory in the subsoil (this is the reverse of normal trends for these elements). Regular phosphorus and nitrogen applications are essential, with strategic trace element applications. Tissue testing for calcium and magnesium levels is also warranted.

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

Rooting depth: 60 cm in pit, but few roots below 40 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 throughout, and associated high boron and chloride, restrict root growth of all but halophytic species. High alkalinity in the subsoil is a further barrier.

Water holding capacity: Approximately 50 mm in the potential root zone (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 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	Trace Elements mg/kg (DTPA)				CEC cmol (+)/kg	Exchangeable Cations cmol(+)/kg			
												Cu	Fe	Zn	Mn		Ca	Mg	Na*	K
0-15	8.9	8.2	0	2.21	29.1	2254	0.46	6	176	160	4.4	0.15	2.8	0.45	0.40	nd	0.80	1.93	8.39	0.39
15-25	8.6	7.8	0	0.895	12.9	890	0.11	<1	102	60.4	2.2	0.44	12	0.60	0.95	nd	0.35	0.72	3.10	0.23
25-40	9.6	9.0	8.6	2.71	26.5	3357	nd	26	935	301	21.0	0.44	9.6	0.41	0.72	nd	5.20	6.13	19.58	2.80
40-60	9.6	9.0	10.8	2.37	18.2	2695	nd	12	1036	223	6.6	0.31	37	1.3	2.77	nd	5.48	5.60	16.68	2.85
60-65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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.