

SAND OVER CLAY ON CALCRETE AT SHALLOW DEPTH

General Description: *Bleached sand over an olive mottled clayey subsoil with calcrete at shallow depth*

Landform: Very gently undulating to level plains (ancient interdune corridors)

Substrate: Calcreted clays, marls and limestones of the Padthaway Formation

Vegetation:



Type Site: Site No.: SE903

1:50,000 sheet: 6925-4 (Laffer) Hundred: Laffer

Annual rainfall: 475 mm Sampling date: 26/11/03

Landform: Flat on level plain

Surface: Soft with minor calcrete stone. Water table at 100 cm.

Soil Description:

Depth (cm)	Description
0-13	Very dark greyish brown (10YR3/2) soft single grain sand. Clear to:
13-24	Very pale brown (10YR8/3) soft single grain sand. Sharp to:
24-30	Olive brown (2.5Y4/3), light olive brown (2.5Y5/4) and dark greyish brown (2.5Y4/2) mottled firm light clay with strong coarse columnar (breaking to medium angular blocky) structure. Sharp to:
30-35	Strongly cemented massive calcrete pan. Abrupt to:
35-60	Olive (5Y5/3) and yellowish brown (10YR5/8) mottled friable massive very highly calcareous sandy light clay with more than 50% calcrete fragments (20-60 mm) and 20-50% soft carbonate segregations. Clear to:
60-70	Strongly cemented massive calcrete pan. Clear to:
70-95	Pale olive (5Y6/3) and olive yellow (5Y6/8) mottled massive friable highly calcareous light clay with more than 50% calcrete fragments (20-60 mm) and 10-20% carbonate veins. Sharp to:
95-100	Strongly cemented massive calcrete pan.



Classification: Petrocalcic, Sodosolic, Salic Hydrosol; medium, non-gravelly, sandy / clayey, shallow OR Eutrophic, Petrocalcic, Brown Sodosol; medium, non-gravelly, sandy / clayey, shallow

Summary of Properties

Drainage: Imperfectly to poorly drained. The shallow water table 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 the accumulation of phosphorus in the subsoil. Regular phosphorus and nitrogen applications are essential, with strategic trace element applications. Tissue testing for calcium and magnesium levels is also warranted.

pH: Neutral in the surface, strongly alkaline with depth.

Rooting depth: 30 cm in pit.

Barriers to root growth:

Physical: The calcrete presents a significant barrier to root growth, although some roots may penetrate fractures. The overlying poorly structured clay also restricts root growth - most activity is confined to the surfaces of the aggregates.

Chemical: Moderately high salinity throughout restricts root growth of all but halophytic species. High pH below 70 cm is an additional barrier.

Water holding capacity: Approximately 25 mm in the potential root zone (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
0-13	7.4	6.8	0	0.899	10.0	1048	2.06	9	131	25.5	1.5	0.19	20	0.66	1.0	nd	2.60	1.97	2.89	0.32
13-24	7.7	7.0	0	0.218	3.00	187	0.25	12	73	14.0	0.6	0.32	44	0.54	1.8	nd	0.69	0.53	0.79	0.14
24-30	8.1	7.4	0	1.072	10.5	1106	0.44	28	550	60.6	4.8	0.28	12	0.79	0.70	nd	5.58	5.78	6.39	1.76
30-35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35-60	9.0	8.3	29.0	1.203	10.2	1252	nd	8	765	87.8	9.0	0.17	3.9	0.46	0.37	nd	9.53	7.55	8.47	2.60
60-70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
70-95	9.3	8.4	14.6	1.337	9.60	1351	nd	<1	760	90.3	3.9	0.18	4.7	0.46	0.43	nd	7.59	7.23	8.79	2.01
95-100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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.