SHALLOW SAND OVER SANDY CLAY ON CALCRETE

General Description: *Sand to loamy sand over a thin brown to red sandy clay overlying calcrete at shallow depth*

Landform: Flat to gently undulating plains with frequent low sandhills and occasional swampy depressions.

Substrate: Interbedded lagoonal sandy clays and limestones (Padthaway Formation)

Vegetation: Mallee heath

Type Site: Site No.: MM107

1:50,000 sheet:	6826-2 (Culburra)	Hundred:	Colebatch
Annual rainfall:	485 mm	Sampling date:	10/03/93
Landform:	Flat		
Surface:	Soft with no stones		

Soil Description:

Depth (cm)	*Description*
0-13	Dark greyish brown loose sand. Clear to:
13-25	Very pale brown (bleached) loose sand. Sharp to:
25-33	Dark yellowish brown hard massive slightly calcareous sandy clay. Sharp to:
33-70	Laminar calcrete. Clear to:
70-94	White hard massive very highly calcareous sandy loam with 20-50% hard carbonate fragments (60-200 mm). Clear to:
94-125	Pale olive very hard highly calcareous sandy clay with weak coarse blocky structure and 10-20% hard carbonate fragments. Gradual to:
125-160	Pale yellow massive hard highly calcareous sandy clay. Abrupt to:
160-170	Limestone.

Classification: Bleached, Petrocalcic, Brown Chromosol; medium, non-gravelly, sandy / clayey, shallow

Summary of Properties

Drainage Well drained. The soil never remains saturated for more than a few days.

Fertility Inherent fertility is low, as indicated by the exchangeable cation data. Phosphorus deficiencies are widespread, and nitrogen levels depend on legume condition of pastures. Zinc and copper deficiencies are likely from time to time. Manganese is required by lupins. At the sampling site, phosphorus levels are low, copper marginal and organic carbon low.

pH Slightly acidic at the surface, strongly alkaline with depth.

Rooting depth 70 cm in pit.

Barriers to root growth

Physical: Calcrete and subsequent limestone layers severely restrict growth.

Chemical: pH is high from 70 cm, but few roots penetrate the calcrete. Low nutrient retention capacity is the main reason for sub-optimal growth.

Water holding capacity 35 mm in the root zone.

Seedling emergence: Satisfactory, but can be reduced by water repellence in dry years.

Workability: Soft to loose surface is easily worked.

Erosion Potential

Water: Low.

Wind: Moderately low to moderate.

Laboratory Data

Depth cm	pH H_2O	pH $CaC1_2$	CO_3 %	EC1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	Boron mg/kg	Trace Elements mg/kg (DTPA)				CEC cmol (+)/kg	Exchangeable Cations cmol(+)/kg				ESP
										Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
Paddock	6.5	5.8	<1	0.08	0.52	0.8	8	190	1.3	0.18	-	5.2	0.74	5.8	4.53	0.72	0.05	0.61	0.9
0-13	6.8	6.3	<1	0.12	0.91	0.9	6	220	1.0	0.08	-	3.4	0.65	4.1	3.69	0.72	0.08	0.70	2.0
13-25	6.8	6.2	<1	0.07	0.41	0.2	2	140	0.59	<0.05	-	0.55	0.06	2.2	1.44	0.39	0.02	0.44	na
25-33	7.9	7.2	1	0.15	0.89	0.4	3	430	1.7	0.10	-	0.73	0.08	13.2	7.55	2.33	0.35	1.22	2.4
33-70	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
70-94	9.3	8.3	11	0.10	0.76	<0.1	<2	47	0.69	0.06	-	0.15	<0.06	1.4	1.68	0.58	0.09	0.13	na
94-125	9.4	8.2	20	0.24	1.88	<0.1	<2	210	2.2	0.18	-	0.18	0.12	6.7	3.72	2.59	0.84	0.54	12.5
125-160	9.5	8.3	12	0.35	2.62	<0.1	<2	330	3.6	0.09	-	0.20	0.06	8.7	2.79	3.89	1.62	0.77	18.6

Note: Paddock sample bulked from cores (0-10 cm) taken around the pit.

CEC (cation exchange capacity) is 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.