CALCAREOUS SANDY LOAM OVER RUBBLY CARBONATE

General Description: *Calcareous sandy loam over rubbly carbonate, becoming less rubbly with depth formed over alluvial clay*

Landform: Gently undulating rises.

Substrate: Alluvial clay (Pooraka Formation), mantled by rubbly carbonates.

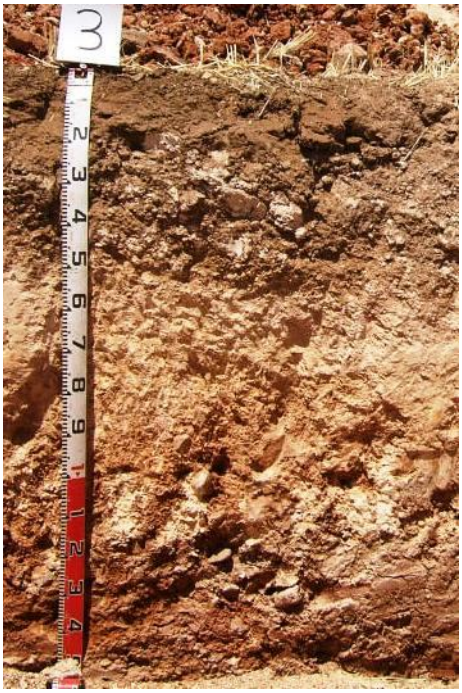
Vegetation:

Type Site:				
	Site No.:	CU076	1:50,000 mapsheet:	6532-2 (Booleroo)
	Hundred:	Willowie	Easting:	259430
	Section:	A602	Northing:	6367530
	Sampling date:	13/02/2013	Annual rainfall:	380 mm average

Upper slope of alluvial fan, 2% slope. Friable surface with no stones.

Soil Description:

Depth (cm)	*Description*
0-18	Dark brown friable very highly calcareous sandy loam with weak granular structure. Clear to:
18-50	Brown friable massive very highly calcareous sandy clay loam with 50-90% carbonate nodules to 60 mm. Clear to:
50-90	Reddish yellow firm massive very highly calcareous clay loam with about 10% carbonate nodules to 6 mm. Gradual to:
90-150	Strong brown hard very highly calcareous medium clay with moderate subangular blocky structure and 20 - 50% carbonate fragments to 60 mm.



Classification: Endohypersodic, Regolithic, Lithocalcic Calcarosol; medium, non- gravelly, loamy / clayey, deep

Summary of Properties

Drainage: Moderately well drained. The upper 50 cm is highly permeable, but the sodic clay from 90 cm has very low permeability. At this depth, in a 350 mm rainfall environment, this is unlikely to cause root zone waterlogging in any but the wettest seasons, but it does affect deep drainage, and therefore causes accumulation of boron and other salts.

Fertility: Inherent fertility is moderate (although exchangeable cation data suggest it may be higher in the surface layers, probably due to the influence of carbonate-calcium and relatively high organic matter content). Moderate to high concentrations of carbonate from the surface tie up phosphorus and trace elements, but data indicate that there are no apparent deficiencies. Organic carbon levels are high for this rainfall zone, but this is not uncommon in highly calcareous soils.

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

Rooting depth: 60 cm, but most roots in upper 50 cm.

Barriers to root growth:

Physical: The high strength clay from 90 cm prevents the growth of roots of annual plants, and significantly affects the penetration of perennials.

Chemical: Elevated pH, sodicity, boron levels and salinity severely limit root growth below 50 cm.

Waterholding capacity: Approximately 40 mm in potential rootzone, due mainly to high proportion of rubble in 18 - 50 cm layer, and shallowness of overall rootzone.

Seedling emergence: Satisfactory. Calcareous soils do not generally set hard or seal over.

Workability: Calcareous sandy loams can be effectively worked over a range of moisture conditions, but over-working will pulverise, leading to increased wind erosion risk.

Erosion Potential

Water: Moderately low.

Wind: Moderately low, but soil will blow if over-worked or excessively grazed.

Laboratory Data

Depth cm	pH H_2O	pH $CaC1_2$	CO_3 %	EC 1:5 dS/m	ECe dS/m	Org.C %	NO_3 mg/kg	Avail. P mg/kg	Avail. K mg/kg	SO_4-S mg/kg	Boron mg/kg	Trace Elements mg/kg (DTPA)				Sum cations cmol (+)/kg	Exchangeable Cations cmol(+)/kg				Est. ESP
												Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
Paddock	8.5	7.8	7.7	0.207	1.5	1.39	23	43	571	5.0	1.3	0.80	3	7.91	0.94	18.8	16.0	1.30	0.14	1.42	0.7
0-18	8.6	7.9	9.3	0.15	1.03	1.23	14	20	308	3.6	1.5	0.85	3	5.21	0.61	19.1	16.6	1.30	0.13	1.08	0.7
18-50	8.9	8.0	19.9	0.133	0.54	0.69	3	9	166	4.0	1.8	0.89	3	2.24	0.15	18.7	15.7	2.22	0.41	0.34	2.2
50-90	9.4	8.4	54.4	1.358	10.42	0.30	34	3	96	139	14.3	0.47	3	0.58	0.07	22.5	8.44	6.26	7.52	0.25	33.5
90-150	9.4	8.4	4.6	1.127	8.48	0.14	16	3	174	138	22.7	0.43	70	17.0	0.22	21.3	4.82	6.94	9.10	0.45	42.7

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

Sum of cations, in a neutral to alkaline soil, approximates the CEC (cation exchange capacity), 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, in this case estimated by the sum of cations.

Further information: DEWNR Soil and Land Program