

SHALLOW SAND ON CALCRETE

General Description: *Sandy topsoil with a bleached subsurface layer on calcreted limestone at shallow depth*

Subgroup soil: B8

Landform: Jumbled dunefield.

Substrate: Padthaway Formation clayey limestone.

Vegetation: Irrigated lucerne.



Type Site:	Site No:	MM165A	1:50,000 mapsheet:	6926-3 (Tintinara)
	Hundred:	Coombe	Easting:	414380
	Section:	76	Northing:	6028670
	Sampling date:	16/08/2005	Annual rainfall:	480 mm average

The site is in a small closed depression, and lies adjacent to a very low sandy rise. Irrigation comes from an underlying aquifer, approximately 80 m below shallow saline groundwater (which is at roughly 4 m depth?).

Soil Description:

Depth (cm)	Description
0–12	Soft, water repellent, very dark greyish brown, clayey sand with single grain structure.
12–31	Bleached, loamy sand with single grain structure.
31–33	Brown, light sandy loam with massive structure.
33–37	Strongly cemented massive calcrete.
37–98	Weak clayey limestone.



Classification: Basic, Petrocalcic, Bleached-Leptic Tenosol; medium, non-gravelly, sandy / sandy, shallow.



Summary of Properties

- Drainage:** Drainage is moderate.
- Fertility:** Inherent fertility is low in the topsoil owing to the sandy nature of the soil (as sand has limited capacity to retain and provide nutrients). Most of the soil's natural fertility is provided by the organic matter present in the surface soil. Maintenance and improvement of surface soil organic matter and residues is important for maintenance of fertility as well as protection against erosion.
- pH:** Soil pH is slightly alkaline to alkaline throughout (which is irrigation induced).
- Rooting depth:** Root growth was observed to 33 cm, with most in the surface soil.
- Barriers to Root Growth:**
- Physical:** The underlying calcrete and limestone layers greatly restrict root growth.
- Chemical:** Fertility is generally adequate for a sandy soil; however, marginal sulfur and boron levels may limit root growth. There are raised levels of salts in the surface soil. There is some risk of seasonal waterlogging (low oxygen conditions) within the profile.
- Waterholding capacity:** Low. Total available: approx 35 mm [(0.12x120)+(0.19x90)+(0.04x100)].
- Seedling emergence:** Good.
- Workability:** Good.
- Erosion Potential:**
- Water:** Low.
- Wind:** Moderately low to moderate. Residue retention and maintenance of surface cover are crucial for protection against erosion.

Laboratory Data

Depth cm	pH H ₂ O	pH CaCl ₂	CO ₃ %	EC 1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	Cl mg/kg	SO ₄ -S mg/kg	Boron mg/kg	Al CaCl ₂ mg/kg	Trace Elements mg/kg (EDTA)				Sum cations cmol (+)/kg	Exchangeable Cations cmol(+)/kg						Est. ESP
													Cu	Fe	Mn	Zn		Ca	Mg	Na	K	Al	H	
Paddock	7.4	6.7	0.2	0.09	1.35	1.4	27	97	19	7.5	1.3	0	2.0	53	16.3	5.4	5.0	3.4	1.3	0.2	0.1	0.0	0.0	4
0-12	7.9	6.9	0.2	0.09	3.32	1.0	17	104	28	5.8	1.0	0	2.1	44	14.1	3.4	4.6	3.1	1.1	0.2	0.1	0.0	0.0	4
12-31	7.9	7.0	0.2	0.04	0.73	0.3	6	64	13	2.9	0.5	0	1.0	49	2.5	0.8	1.8	1.1	0.4	0.2	0.1	0.0	0.0	10
31-33																								
33-37																								
37-98																								

Note: Paddock sample bulked from 20 cores (0-10 cm) taken around the pit.

Sum of cations 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](#)

