

## SAND OVER BROWN SODIC CLAY

**General Description:** *Sandy loam surface soil with a bleached sandy subsurface layer over brown dispersive clay with soft carbonate*

**Subgroup soil:** G4

**Landform:** Level plain

**Substrate:** Alluvial heavy clay

**Vegetation:** Cape weed and clover.



<b>Type Site:</b>	Site No:	SE143	1:50,000 mapsheet:	7025-4 (Cannawigara)
	Hundred:	Cannawigara	Easting:	465740
	Section:	82	Northing:	6001740
	Sampling date:	21/10/08	Annual rainfall:	475 mm average

### Soil Description:

<i>Depth (cm)</i>	<i>Description</i>
0–11	Hardsetting, slightly repellent, very dark greyish brown, sandy loam with massive structure.
11–18	Bleached, loamy sand with massive structure.
18–30	High-strength, greyish brown, yellowish brown and very dark greyish brown, medium heavy clay with strong, coarse columnar parting to weak subangular blocky structure.
30–50	High-strength, light olive grey and yellowish brown, medium heavy clay with strong, coarse prismatic parting to moderate subangular blocky structure.
50–90	Highly calcareous, high-strength, light yellowish brown and dark brown, medium heavy clay with moderate, coarse prismatic parting to moderate, fine polyhedral structure and 20–50% soft carbonate segregations (20–60 mm in diameter).
90–120	High-strength, pale olive and strong brown, heavy clay with moderate, coarse prismatic parting to moderate, fine polyhedral structure and soft carbonate present in vertical cracks.
120–160	High-strength, pale olive and strong brown, heavy clay with moderate, coarse prismatic parting to moderate, fine lenticular structure and soft carbonate present in vertical cracks [Blanchetown Clay Formation].



**Classification:** Calcic, Mottled-Subnatric, Brown Sodosol; medium, non-gravelly, loamy/clayey, moderate.



## Summary of Properties

<b>Drainage:</b>	Drainage is imperfect.
<b>Fertility:</b>	Inherent fertility is low in the topsoil (especially in the bleached subsurface layer), but high in the subsoil, as the sandy topsoil has limited capacity to retain and provide nutrients, unlike the clayey subsoil. However, much of the soil's fertility is provided by the organic matter present in the surface soil (which is at relatively low levels). Maintenance and improvement of surface soil organic matter and residues is important for maintenance of fertility as well as protection against erosion.
<b>pH:</b>	Soil pH is neutral in the surface soil, grading to strongly alkaline in the lower subsoil.
<b>Rooting depth:</b>	Viewed in the pit: most roots occur above 30 cm, with some to 120 cm.
<b>Barriers to Root Growth:</b>	
<b>Physical:</b>	Dispersiveness and high subsoil strength limit root growth.
<b>Chemical:</b>	High pH, low levels of some nutrients (e.g. zinc and phosphorus?), and low oxygen levels associated with wetness, may limit root growth with depth. There is the likelihood of a seasonal perched watertable that would also limit root growth. Topsoil levels of sulfur and boron are low to marginal.
<b>Waterholding capacity:</b>	Moderate. Total available: approx 75 mm $[(0.11 \times 115) + (0.07 \times 90) + (0.12 \times 160) + (0.2 \times 150 \times 0.5) + (0.4 \times 150 \times 0.3) + (0.3 \times 150 \times 0.1)]$ .
<b>Seedling emergence:</b>	Good.
<b>Workability:</b>	Good.
<b>Erosion Potential:</b>	
<b>Water:</b>	Low.
<b>Wind:</b>	Moderate. Residue retention and maintenance of surface cover are important for protection against erosion.

## Laboratory Data

Depth cm	pH H <sub>2</sub> O	pH CaCl <sub>2</sub>	CO <sub>3</sub> %	EC 1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	Cl mg/kg	SO <sub>4</sub> -S mg/kg	Boron mg/kg	Al CaCl <sub>2</sub> 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	6.7	5.7	0.3	0.06	0.51	1.2	41	263	24	4	0.7	0	1.1	237	4.3	6.0	4.6	3.0	0.9	0.2	0.4	0.0	0.0	5
0-11	7.1	6.5	0.2	0.09	0.58	1.2	41	404	20	4.5	0.7	0	1.0	198	4.5	2.7	5.1	3.3	0.9	0.3	0.7	0.0	0.0	5
11-18	6.8	6.2	0.3	0.06	0.41	0.8	36	254	11	4	0.6	0	1.1	247	5.3	1.0	4.4	2.8	0.9	0.2	0.4	0.0	0.0	6
18-30	7.5	6.9	0.2	0.12	0.97	0.3	4	447	52	12.3	1.8	0	0.7	70	3.4	0.2	16.2	9.7	4.9	0.3	1.3	0.0	0.0	2
30-50	8.1	7.3	0.3	0.12	0.93	0.1	2	418	51	17.2	2.3	0	0.3	51	0.9	0.1	16.2	9.1	5.4	0.4	1.2	0.0	0.0	3
50-90	9.1	8.1	11.0	0.25	1.33	0.1	2	488	53	31.1	2.7	0	0.6	14	2.3	0.1	21.8	14.3	5.8	0.6	1.1	0.0	0.0	3
90-120	9.4	8.6	2.2	0.35	0.86	0.1	2	684	50	33.8	8.2	0	0.7	20	6.9	0.1	22.3	7.8	9.7	3.1	1.6	0.0	0.0	14
120-160	9.3	8.6	2.2	0.48	1.60	0.0	2	684	107	43.3	16.5	0	0.9	22	6.0	0.2	14.7	5.6	6.0	2.1	1.0	0.0	0.0	14

**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](#)

