

THICK TO VERY THICK SAND OVER BROWN SODIC CLAY

General Description: *Light sandy loam surface soil, and a bleached sandy subsurface layer, overlies dark yellowish brown dispersive clay*

Subgroup soil: G3

Landform: Gently undulating plain. Site is on a slight rise.

Substrate: Alluvial clay.

Vegetation: Irrigated oats. Irrigation via a centre-pivot irrigator.



Type Site:	Site No:	SE152	1:50,000 mapsheet:	7022-1 (Nangwarry)
	Hundred:	Mingbool	Easting:	495260
	Section:	242E	Northing:	5836390
	Sampling date:	24/10/08	Annual rainfall:	720 mm average

Soil Description:

Depth (cm)	Description
0–15	Firm, repellent, very dark greyish brown, light sandy loam with single-grain structure. [Worm activity is evident to 70 cm.]
15–39	Bleached, loamy sand with single-grain structure.
39–60	Bleached, loamy sand with single-grain structure.
60–70	Dark yellowish brown, dispersive, sandy medium heavy clay with weak, fine subangular blocky structure.
70–95	Olive brown, yellowish brown and red, sandy medium heavy clay with weak, fine lenticular structure.
95–120	Greenish grey, light olive brown and yellowish brown, sandy medium heavy clay with massive structure.
120–145	Greenish grey and yellowish brown, sandy medium heavy clay with massive structure, 10–20% fine quartz gravel, 2–10% hard carbonate fragments and 2–10% soft carbonate segregations.
145–155	Greenish grey, yellowish brown and light olive brown, sandy medium heavy clay with massive structure, 10–20% hard carbonate fragments and 10–20% soft carbonate segregations.



Classification: Hypocalcic, Mottled-Subnatric, Brown Sodosol; thick, non-gravelly, sandy/clayey, moderate.



Summary of Properties

Drainage:	Drainage is moderate to imperfect.
Fertility:	Inherent fertility is low in the topsoil (especially in the bleached subsurface layer), but relatively higher 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. Maintenance and improvement of surface soil organic matter and residues is important for maintenance of fertility and protection against erosion. Boron levels are probably low. There is evidence of phosphorus leaching (to 70 cm).
pH:	Soil pH is slightly alkaline in the topsoil (which is irrigation induced), slightly acidic in the upper to mid subsoil, and neutral to alkaline below this.
Rooting depth:	Viewed in the pit: most roots occur above 60 cm, with some to 95 cm.
Barriers to Root Growth:	
Physical:	Dispersiveness in the upper subsoil is likely to limit root growth.
Chemical:	Low levels of some nutrients (e.g. zinc and copper), and probably low oxygen levels associated with seasonal perched water (which may be exacerbated by irrigation), may limit root growth with depth. The dominant subsoil colour from 70–95 cm indicates seasonal waterlogging in this layer, while the dominant subsoil-substrate colour below this indicates virtual permanent wetness. Raised levels of salts occur in the upper subsoil.
Waterholding capacity:	Moderate. Total available: approx 75 mm $[(0.15 \times 110) + (0.45 \times 90) + (0.1 \times 150 \times 0.5) + (0.25 \times 150 \times 0.3)]$.
Seedling emergence:	Good.
Workability:	Good.
Erosion Potential:	
Water:	Low.
Wind:	Moderate. Residue retention and maintenance of surface cover are important 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	7.7	7.2	0.4	0.24	1.77	2.4	78	172	95	22	0.9	0	3.0	129	21.9	13.2	8.4	7.3	0.8	0.2	0.1	0.0	0.0	2
0-15	7.5	7	0.2	0.23	1.78	3.1	79	167	124	34.3	1.0	2.5	3.1	114	27.3	13.8	8.3	7.2	0.8	0.2	0.1	0.0	0.0	2
15-39	7.9	7.2	0.2	0.05	0.52	0.3	18	35	14	4.5	0.3	0	0.8	57	2.2	0.5	1.5	1.2	0.1	0.2	0.0	0.0	0.0	12
39-60	7.6	7.1	0.2	0.10	1.60	0.2	9	22	66	18.1	0.3	0	0.3	80	3.1	0.4	1.3	0.9	0.1	0.2	0.0	0.0	0.0	17
60-70	6.6	6.3	0.3	0.30	2.89	0.7	13	73	261	67.8	1.0	0	0.1	109	2.9	0.4	9.3	6.5	2.0	0.6	0.2	0.0	0.0	7
70-95	6.7	6.2	0.3	0.27	1.76	0.3	3	65	264	80.6	1.5	0	0.2	21	2.6	0.3	11.6	8.1	2.6	0.7	0.2	0.0	0.0	6
95-120	7.3	6.7	0.4	0.20	1.49	0.2	2	84	230	60.7	1.7	0	0.2	5.8	1.3	0.5	13.4	9.3	3.2	0.5	0.2	0.1	0.0	4
120-145	8	7.5	0.5	0.20	1.59	0.1	2	82	152	45.8	1.4	0	0.3	10	19.7	0.4	10.1	7.6	2.0	0.3	0.2	0.0	0.0	3
145-155	8.3	7.7	0.4	0.29	1.71	0.2	2	104	216	43.9	1.3	0	0.2	17	4.4	0.3	20.8	17.2	2.8	0.4	0.3	0.0	0.0	2

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](#)

