

SAND OVER POORLY STRUCTURED CLAY

General Description: *Medium thickness grey sand with a bleached subsurface layer, over a coarsely structured dispersive brown mottled clay, calcareous with depth*

Landform:

Substrate: Tertiary age sandy clay capped by fine windblown carbonate.

Vegetation:



Type Site: Site No.: SE131 1:50,000 mapsheet: 7025-4 (Cannawigara)
 Hundred: Cannawigara Easting: 475300
 Section: 37 Northing: 5993170
 Sampling date: 22/02/07 Annual rainfall: 480 mm average

Flat on very gently undulating plain. Loose surface with no stones. Delved to 45 cm.

Soil Description:

Depth (cm)	Description
0-12	Very dark greyish brown loose loamy sand with fragments of clay. Abundant roots. Sharp to:
12-14	Bleached friable massive sand, following columns to depth (~50 cm). Roots common. Abrupt to:
14-40	Yellowish brown and brown mottled sandy light medium clay with very coarse columnar structure, breaking to coarse angular blocky. Thin siliceous pan on surface of columns. Roots common to many. Gradual to:
40-54	Light yellowish brown and yellowish brown mottled slightly calcareous sandy light medium clay with very coarse prismatic structure, breaking to weak coarse angular blocky. Roots few to common. Abrupt to:
54-80	Yellow with yellowish brown mottles firm very highly calcareous sandy medium clay with medium angular blocky structure and more than 50% fine carbonate. Very few roots. Clear to:
80-130	Light yellowish brown hard calcareous sandy light medium clay with coarse prismatic structure, breaking to medium angular blocky. Very few roots. Diffuse to:
130-160	Yellowish brown hard sandy light clay with weak coarse prismatic structure. No roots.



Classification: Hypercalcic, Mottled-Mesonatric, Brown Sodosol; medium, non-gravelly, sandy / clayey, deep



Summary of Properties

- Drainage:** Imperfectly drained. Water is likely to perch on top of the clay subsoil for several weeks following heavy or prolonged rainfall. There are strong preferential drainage pathways along the sandy edges of soil columns
- Fertility:** Inherent fertility is low due to low clay content of surface. Surface fertility has been improved by delving (50% increase in sum of cations compared with similar undelved soils). Surface nutrient status is adequate for most crops and pastures. The bleached subsurface sandy layer is highly leached and nutrient deficient, particularly in potassium, zinc and manganese. This layer has a very low capacity to retain soluble nutrients, including phosphorus.
- pH:** Neutral at the surface, alkaline in the subsoil, and strongly alkaline at depth.
- Rooting depth:** Few roots below 54 cm in the sampling pit
- Barriers to root growth:**
- Physical:** The hard and very coarsely structured subsoil clay is a significant barrier, made worse by the silcrete capping. Roots are largely confined to the aggregate surfaces. Waterlogging above the clay restricts root abundance in the subsurface, and preferential drainage increases leaching losses of nutrients and water.
- Chemical:** Root growth is restricted by the very low fertility of the bleached subsurface layer, high sodicity and pH from 40 cm, and elevated salinity / chloride and boron concentrations from 54 cm.
- Waterholding capacity:** Approximately 60 mm total available water in the potential rootzone.
- Seedling emergence:** Satisfactory provided that delving has controlled water repellence.
- Workability:** Good. Sandy soils are easily worked.
- Erosion Potential:**
- Water:** Low.
- Wind:** Moderate.

Laboratory Data

Depth cm	pH H ₂ O	pH CaCl ₂	CO ₃ %	EC1:5 dS/m	ECe dS/m	Cl mg/kg	Org.C %	NO ₃ + NH ₄ mg/kg	Avail. P mg/kg	Avail. K mg/kg	SO ₄ -S mg/kg	React Fe mg/kg	Boron 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	
0-12	6.8	5.9	0	0.10	1.15	87	1.64	20	64	174	8.2	994	1.6	4.4	377	5.0	4.0	6.9	4.9	1.1	0.4	0.5	6.1
12-14	6.8	6.0	0	0.03	0.30	10	0.23	2	13	38	2.6	194	0.4	1.5	91	0.9	0.2	1.4	0.9	0.2	0.1	0.1	8.9
14-40	8.2	7.1	0	0.14	1.51	65	0.28	3	2	185	19.8	730	3.0	1.1	75	1.5	0.5	15.6	4.1	7.9	3.1	0.6	19.5
40-54	9.4	8.5	1	0.34	1.86	160	0.16	4	2	311	34.3	645	9.2	1.3	49	2.2	0.3	23.5	6.4	10.5	5.8	0.9	24.7
54-80	9.6	8.7	31	0.60	3.36	484	0.21	4	2	350	74.2	489	11.1	1.2	22	1.1	0.2	31.6	9.7	12.4	8.6	0.9	27.1
80-130	9.7	8.8	2	0.65	3.93	655	0.09	3	2	414	104	586	13.1	1.4	29	6.0	0.4	31.3	5.6	13.2	11.3	1.2	36.1
130-160	8.9	7.8	0	0.72	5.10	773	0.07	3	2	350	108	436	11.6	1.4	38	18.4	0.3	25.1	2.0	12.6	9.6	0.9	38.3

Note: 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](#)

