

## HARD LOAMY SAND OVER DISPERSIVE RED CLAY

**General Description:** *Hard setting sandy surface soil sharply overlying a hard reddish clay subsoil with columnar structure, grading to a Class III A carbonate layer on sandstone.*

**Landform:** Undulating rises to low hills with slopes of 3-15%.

**Substrate:** Tertiary age sandstones, calcified by windblown lime, leached in through overlying soil.

**Vegetation:**



**Type Site:** Site No.: CU006  
 Hundred: Narridy  
 Section: 403  
 Sampling date: 21/02/1992

1:50,000 mapsheet: 6531-2 (Gladstone)  
 Easting: 245400  
 Northing: 6307500  
 Annual rainfall: 435 mm average

Midslope of undulating rise, 8% slope. Hard setting surface, no stones.

### Soil Description:

Depth (cm)	Description
0-10	Reddish brown hard massive loamy sand. Abrupt to:
10-15	Pink hard massive loamy sand. Sharp to:
15-40	Red hard coarse columnar structured sandy clay. Clear to:
40-70	Red firm coarse subangular blocky structured sandy clay with 20-50% fine calcareous segregations. Diffuse to:
70-130	Light brown massive very highly calcareous sandy clay loam (Class III A carbonate layer). Diffuse to:
130-150	Soft sandstone.



**Classification:** Calcic, Mesonatric, Red Sodosol; medium, non-gravelly, sandy / clayey, deep



## Summary of Properties

- Drainage:** Moderately well drained. Soil is rarely wet for more than a week.
- Fertility:** Fair, due to sandiness of surface soil and low organic carbon levels (1% is minimum desirable level). Phosphorus (20 mg/kg) is low at type site.
- pH:** Neutral at surface, grading to strongly alkaline with depth. Availability of trace elements below 40 cm is very low.
- Rooting depth:** 70 cm at type site, but few roots below 40 cm.
- Barriers to root growth:**
- Physical:** Hard poorly structured clay subsoil, caused by the high percentage of exchangeable sodium (Na), restricts root growth.
  - Chemical:** High exchangeable sodium and carbonate (CaCO<sub>3</sub>) levels below 40 cm result in very alkaline conditions, inhibiting root growth. There is negligible salinity.
- Waterholding capacity:** 70-100 mm in rootzone (moderate), although not all is available due to poor root development below 40 cm, and tendency for the lower part of the topsoil and upper clay layer to dry out rapidly.
- Workability:** Fair to poor, due to poorly structured surface and a narrow moisture range for effective working. Low organic carbon, excessive sodium and high fine sand content all contribute to this condition. There are no rocks or stones.
- Seedling establishment:** Fair to poor due to potential for surface sealing and waterlogging.
- Erosion potential:**
- Water:** Very high, due to sandy poorly structured surface and shallow depth to subsoil.
  - Wind:** Low to moderately low.

## Laboratory Data

Depth cm	pH H <sub>2</sub> O	pH CaCl <sub>2</sub>	CO <sub>3</sub> %	EC1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	SO <sub>4</sub> mg/kg	Boron mg/kg	Trace Elements mg/kg (DTPA)				CEC cmol (+)/kg	Exchangeable Cations cmol(+)/kg				ESP
											Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
Paddock	7.2	6.1	0.0	0.05	-	0.68	20	100	-	-	0.45	13.1	8.9	0.73	-	-	-	-	-	-
0-10	7.3	6.4	0.0	0.07	0.6	0.62	16	80	-	-	0.41	15.0	4.5	0.60	5.9	3.95	1.01	0.43	0.20	7.3
10-15	7.8	6.4	0.0	0.03	0.4	0.29	7	70	-	-	0.28	4.0	1.1	0.16	4.5	3.36	0.99	0.36	0.12	8.0
15-40	9.2	7.8	1.2	0.22	0.6	0.30	2	60	-	2.8	0.46	3.3	0.7	0.08	17.1	7.86	6.06	2.72	2.16	16
40-70	10.0	8.5	17.0	0.31	1.5	0.24	3	45	-	3.0	0.32	1.0	0.3	0.06	6.2	2.11	3.42	2.12	0.08	34
70-130	10.0	8.5	10.7	0.28	1.8	0.15	1	25	-	1.5	0.26	0.4	0.2	0.05	4.0	1.68	2.04	1.70	0.05	43
130-150	9.4	8.4	1.8	0.07	0.3	0.08	1	15	-	0.5	0.19	0.2	0.1	0.05	2.9	1.53	1.34	0.11	0.05	3.8

- Note:** Paddock sample bulked from cores (0-10 cm) taken around the pit.  
CEC (cation exchange capacity) is 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.

**Further information:** [DEWNR Soil and Land Program](#)

