SANDY LOAM OVER SODIC RED CLAY ON SANDSTONE

General Description: *Hard sandy loam over a coarsely structured sodic red clay, calcareous with depth, forming in weathering quartzitic sandstone*

Landform: Undulating low hills.

Substrate: Highly weathered quartzitic sandstone, mantled by soft windblown carbonates.

Vegetation:

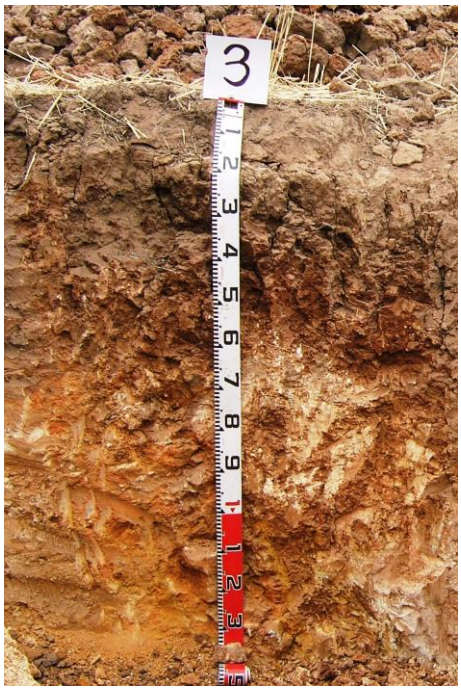
Type Site:

Site No.:	CM111	1:50,000 mapsheet:	6630-2 (Apoinga)
Hundred:	Stanley	Easting:	294330
Section:	310	Northing:	6242140
Sampling date:	07/02/2013	Annual rainfall:	535 mm average

Lower slope of low hill, 3% slope. Hard setting surface, no stones.

Soil Description:

Depth (cm)	*Description*
0-20	Very dark grey hard sandy loam with moderate granular structure. Abrupt to:
20-60	Reddish brown very hard medium clay with strong coarse angular blocky structure. Clear to:
60-95	Strong brown very hard highly calcareous heavy clay with moderate coarse angular blocky structure and 10-20% soft calcareous segregations. Clear to:
95-130	Reddish yellow hard heavy clay with 20-50% sandstone fragments to 200 mm.



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

Summary of Properties

Drainage: Imperfectly drained. The sodic clay subsoil has low permeability, so parts of the sub-surface may remain wet for up to several weeks following heavy or prolonged rainfall.

Fertility: Inherent fertility is moderate, as indicated by the exchangeable cation data. The sandy loam surface has relatively low nutrient retention capacity, but the subsoil's capacity is high. There are no apparent nutrient element deficiencies, and organic carbon levels are high for this soil type / rainfall zone.

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pH: Slightly acidic at the surface, strongly alkaline with depth.

Rooting depth: Moderate root growth in the upper 70 cm, with no roots observed below this depth.

Barriers to root growth:

Physical: High clay strength limits root proliferation.

Chemical: Elevated sodicity (from 60 cm), and pH and salinity (from 95 cm) limit deeper root growth.

Waterholding capacity: Approximately 85 mm in potential rootzone.

Seedling emergence: The surface sets hard and seals when dry, affecting emerging seedlings in unfavourable weather conditions.

Workability: The surface soil tends to shatter if worked too dry, and puddle if worked too wet, so there is a limited moisture range for effective working.

Erosion Potential

Water: Moderate due to the highly erodible nature of the soil, and the position in the landscape.

Wind: Moderately low.

Laboratory Data

Depth cm	pH H_2O	pH $CaC1_2$	CO_3 %	EC 1:5 dS/m	ECe dS/m	Org.C %	NO_3 mg/kg	Avail. P mg/kg	Avail. K mg/kg	SO_4-S mg/kg	Boron mg/kg	Trace Elements mg/kg (DTPA)				Sum cations cmol (+)/kg	Exchangeable Cations cmol(+)/kg				Est. ESP
												Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
Paddock	6.2	5.7	0	0.123	1.29	1.74	23	146	179	8.0	0.7	0.35	122	7.91	1.64	6.5	4.62	1.11	0.29	0.46	4.5
0-20	6.7	6.1	0	0.168	1.5	2.08	29	155	230	9.8	0.6	0.28	93	8.85	1.96	8.3	5.78	1.55	0.35	0.58	4.2
20-60	9.0	8.1	0	0.344	1.19	0.47	2	7	163	27.8	5.8	0.52	15	3.70	0.12	24.4	9.77	9.90	4.31	0.45	17.6
60-95	9.2	8.3	19.4	0.945	4.40	0.26	2	39	100	169.2	3.5	0.55	7	1.40	1.52	23.4	8.23	7.39	7.48	0.27	32.0
95-130	9.5	8.5	0	0.643	4.92	0.10	< 1	6	62	132	1.9	0.29	3	0.78	0.10	15.1	4.17	4.92	5.82	0.16	38.6

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

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