SANDY CLAY LOAM OVER SODIC RED CLAY ON ROCK

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

Landform: Gently undulating rises.

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

Vegetation:

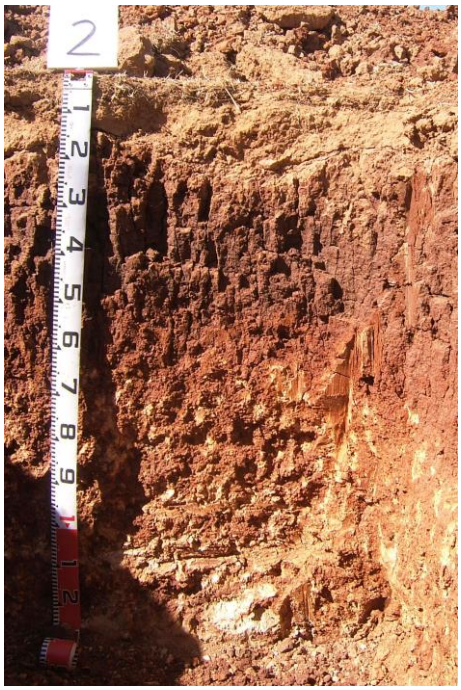
Type Site:

Site No.:	CM114	1:50,000 mapsheet:	6630-1 (Burra)
Hundred:	Kingston	Easting:	310170
Section:	2	Northing:	6289240
Sampling date:	12/02/2013	Annual rainfall:	415 mm average

Alluvial fan at base of low rise, 2% slope. Hard setting surface, no stones.

Soil Description:

Depth (cm)	*Description*
0-6	Reddish brown hard massive coarse sandy loam. Clear to:
6-18	Yellowish red hard massive coarse sandy clay loam with 10-20% quartz gravel. Abrupt to:
18-50	Dark red very hard medium clay with strong coarse prismatic, breaking to coarse angular blocky structure. Gradual to:
50-65	Dark red hard moderately calcareous medium clay with strong coarse prismatic, breaking to coarse angular blocky structure. Gradual to:
65-100	Dark red hard very highly calcareous medium clay with moderate medium angular blocky structure, 2-10% soft calcareous segregations, and 10-20% calcrete fragments to 20 mm. Clear to:
100-130	Dark red highly calcareous medium clay with 20-50% weathering sandstone fragments and 10-20% calcrete nodules.



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

Summary of Properties

Drainage: Moderately well to imperfectly drained. The sodic clay subsoil has restricted permeability, causing subsoil saturation for a week 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, other than a marginal zinc and sulphur levels. Organic carbon levels are a little low for this soil type / rainfall zone.

pH: Acidic at the surface, alkaline with depth.

Rooting depth: Some roots to 70 cm, but most growth is shallower than 50 cm.

Barriers to root growth:

Physical: High clay strength limits root proliferation.

Chemical: Elevated sodicity, pH, salinity, and boron concentration combine to limit root growth.

Waterholding capacity: Approximately 70 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 low. Soil is erodible, but slope is gentle.

Wind: 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	5.2	0	0.087	0.58	1.20	2	64	388	6.2	0.7	0.87	60	61.1	1.13	3.8	1.96	0.71	0.28	0.86	7.3
0-6	6.2	5.6	0	0.092	0.65	1.38	1	71	457	6.5	0.7	0.77	56	50.5	0.83	4.1	1.97	0.71	0.30	1.10	7.4
6-18	6.3	5.3	0	0.055	0.40	0.69	2	43	318	4.6	0.6	1.01	25	49.5	0.35	4.1	2.01	0.95	0.34	0.77	8.4
18-50	8.3	7.3	0	0.358	1.59	1.04	< 1	3	673	16.0	7.8	1.84	10	2.15	0.29	30.9	8.6	13.8	6.79	1.73	22.0
50-65	8.3	7.9	7.1	0.886	2.92	0.56	< 1	2	561	96.8	12.9	1.52	6	1.70	0.25	34.0	10.7	13.5	8.48	1.44	24.9
65-100	9.1	8.1	25.9	0.714	3.31	0.35	< 1	2	369	104	8.9	0.91	5	1.28	0.24	26.4	9.66	9.10	6.70	0.95	25.4
100-130	8.4	8.0	18.5	1.082	6.88	0.33	1	3	371	208	5.8	0.83	6	1.54	0.22	26.9	8.24	9.44	8.26	0.93	30.7

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