SANDY LOAM OVER RED CLAY ON CARBONATE RUBBLE

General Description: *Hard setting sandy loam to sandy clay loam over a strongly structured red clay with abundant soft and rubbly carbonate in lower subsoil, grading to red or brown alluvial clay*

Landform: Gently undulating alluvial fans.

Substrate: Alluvial clay (Pooraka Formation) mantled by windblown calcareous deposits.

Vegetation:

Type Site:

Site No.:	CM107	1:50,000 mapsheet:	6529-4 (Wakefield)
Hundred:	Kulpara	Easting:	229170
Section:	257	Northing:	6231390
Sampling date:	15/02/2013	Annual rainfall:	440 mm average

Midslope of alluvial fan with slope of 3%. Firm surface with no stones.

Soil Description:

Depth (cm)	*Description*
0-12	Dark reddish brown firm light sandy clay loam with moderate granular structure. Abrupt to:
12-40	Dark reddish brown hard medium clay with weak coarse prismatic, breaking to strong medium angular blocky structure. Clear to:
40-80	Strong brown firm very highly calcareous massive light clay with up to 20-50% calcareous nodules to 20 mm, and 20-50% soft calcareous segregations. Gradual to:
80-120	Strong brown very highly calcareous medium clay with 10-20% carbonate nodules to 20 mm, and 10-20% soft calcareous segregations.

Classification: Sodic, Supracalcic, Red Chromosol; medium, non-gravelly, loamy / clayey, deep

Summary of Properties

Drainage: Moderately well to imperfectly drained. The subsoil may remain wet for a week or so following heavy or prolonged rainfall, and for several weeks in wet seasons.

Fertility: Inherent fertility is high, as indicated by the exchangeable cation data (CEC exceeding 15 cmol(+)/kg means high nutrient retention capacity). There are no deficiencies at this site according to the laboratory data. Organic carbon levels are high for this soil type / rainfall zone.

pH: Slightly acidic at the surface, strongly alkaline from 80 cm.

Rooting depth: Most root growth is in the upper 60 cm, with some roots persisting to 80 cm.

Barriers to root growth:

Physical: There are no apparent physical barriers above the substrate clay (i.e. from 80 cm).

Chemical: High sodicity (ESP greater than 25%, high pH (greater than 9.2 in water), and high boron concentrations (more than 15 mg/kg) restrict deeper root growth.

Waterholding capacity: Approximately 75 mm in potential rootzone.

Seedling emergence: Moderate – surface soil can seal over restricting emergence.

Workability: Moderate – surface soil prone to shattering if worked to dry, and puddling if worked too wet.

Erosion Potential

Water: Slight to moderate due to slope – soil surface is erodible.

Wind: Moderately low to low. Surface soil is coherent, but if pulverised by livestock trampling or excessive cultivation it will erode.

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	6.5	6.1	0	0.159	0.73	1.78	7	55	551	10.9	1.2	1.57	29	45.4	1.09	19.6	14.4	3.51	0.29	1.41	1.5
0-12	6.6	6.2	0	0.235	1.15	2.46	16	128	1264	21.4	1.5	1.50	34	54.2	2.40	18.3	12.6	3.06	0.23	2.32	1.3
12-40	8.4	7.5	1.2	0.190	0.68	1.02	< 1	5	214	28.1	2.8	1.21	10	6.12	0.32	28.8	21.9	5.33	1.07	0.55	3.7
40-80	9.2	8.2	36.7	0.571	2.52	0.63	< 1	5	231	22.9	4.8	1.43	6	2.50	0.25	25.4	14.4	5.26	5.22	0.59	20.5
80-120	9.4	8.4	29.7	0.960	4.13	0.41	< 1	3	330	96.2	19.9	1.02	7	1.63	0.18	27.6	10.8	6.61	9.28	0.85	33.7

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