BROWN CRACKING CLAY

General Description: *Brown cracking clay with coarse structure and dispersive subsoil which is calcareous with depth*

Subgroup soil: E3

Landform: Level plain

Substrate: Heavy clay

Vegetation: Annual pasture with annual barley grass.

Type Site:

Site No:	SE141	1:50,000 mapsheet:	7025-2 (Tatiara)
Hundred:	Tatiara	Easting:	490570
Section:	408	Northing:	5965220
Sampling date:	20/10/08	Annual rainfall:	510 mm average

Non-irrigated alluvial plain.

Soil Description:

Depth (cm)	*Description*
0–8	Hardsetting, cracking, very dark greyish brown, heavy fine sandy clay loam with weak, coarse prismatic structure.
8–20	High-strength, dark brown and dark yellowish brown, light medium clay with weak, coarse prismatic parting to weak subangular blocky structure.
20–45	High-strength, olive brown, heavy clay with weak, coarse prismatic parting to moderate subangular blocky structure.
45–80	Highly calcareous, high-strength, olive brown, heavy clay with weak, coarse prismatic parting to moderate subangular blocky structure.
80–115	Highly calcareous, high-strength, light olive brown, heavy clay with moderate subangular blocky structure and 20–50% soft carbonate segregations (20–60 mm in diameter).
115–150	High-strength, light olive brown and yellowish brown, heavy clay with moderate lenticular structure.
Note:	Old tree roots are evident at depth.

Classification: Vertic, Calcic, Brown Dermosol; thin, non-gravelly, clay loamy/clayey, moderate.

Summary of Properties

Drainage: Drainage is imperfect to poor.

Fertility: Inherent fertility is good, as the soil as a high capacity to retain and supply nutrients owing to high clay content.

pH: Soil pH ranges from alkaline in the surface soil to strongly alkaline in the middle to lower subsoil.

Rooting depth: Viewed in the pit: most roots occur above 45 cm, with some to 115 cm.

Barriers to Root Growth:

Physical: Dispersiveness and very high soil strength limit root growth.

Chemical: High pH, low levels and restricted availability of some nutrients (e.g. phosphorus and zinc), raised levels of salts, and probably low oxygen levels associated with wetness and high bulk density, may limit root growth with depth. Also, sulfur levels are low to marginal in the topsoil layers.

Waterholding capacity: High. Total available: approx 100 mm [(0.08x180)+(0.12x160)+(0.25x150)+(0.35x150x0.4)+(0.35x150x0.2)].

Seedling emergence: Poor. Careful surface management at optimum moisture content is required, together with maintenance and improvement of organic matter and possibly gypsum, to improve surface condition.

Workability: Poor owing to high clay content, high strength and poor structure (see above).

Erosion Potential:

Water: Low.

Wind: Low.

Laboratory Data

Depth cm	pH H_2O	pH $CaCl_2$	CO_3 %	EC 1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	Cl mg/kg	SO_4 -S mg/kg	Boron mg/kg	Al $CaCl_2$ 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	Al	H	
Paddock	8.2	7.3	0.3	0.22	1.88	2.2	45	500	124	7.4	1.8	0	1.1	250	29	0.9	13.4	7.3	4.3	0.6	1.2	0.0	0.0	5
0-8	8.2	7.2	0.2	0.17	1.44	2.0	46	477	52	7.1	2.2	0	2.5	423	47	1.7	8.9	5.3	2.6	0.4	0.6	0.0	0.0	5
8-20	8.2	7.2	0.2	0.14	1.16	0.5	8	301	62	5.2	2.4	0	1.7	167	16	0.4	13.7	6.2	5.3	1.5	0.8	0.0	0.0	11
20-45	8.5	7.6	0.3	0.26	1.85	0.3	3	398	168	12.3	5.2	0	1.5	50	23	0.4	18.9	6.8	8.1	2.9	1.2	0.0	0.0	15
45-80	9.3	8.6	4.2	0.65	2.65	0.2	2	445	376	42.5	12.4	0	0.7	7	3.3	0.1	30.9	15.2	10.4	3.7	1.2	0.0	0.1	12
80-115	9.5	8.6	11.5	0.66	3.73	0.1	2	269	392	113	9.4	0	0.6	8	1.4	0.2	29.6	17.7	8.1	3.0	0.7	0.0	0.1	10
115-150	9.3	8.6	3.8	0.84	4.59	0.0	2	234	477	108	9.3	0	0.7	10	2.5	0.1	14.7	7.7	4.5	2.0	0.4	0.0	0.0	14

Note: Paddock sample bulked from 20 cores (0-10 cm) taken around the pit.

Sum of cations 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