GREY CRACKING CLAY

General Description: *Grey cracking clay with cloddy surface soil and dispersive subsoil which is calcareous with depth*

Subgroup soil: E3

Landform: Level plain

Substrate: Massively structured, alluvial, sandy light clay

Vegetation: Pasture: persian clover, white clover and short-lived perennial ryegrass. Millet is grown in summer.

Type Site:

Site No:	SE139	1:50,000 mapsheet:	7025-2 (Tatiara)
Hundred:	Tatiara	Easting:	492410
Section:	918	Northing:	5965210
Sampling date:	20/10/08	Annual rainfall:	510 mm average

Level alluvial plain used for dairy cattle and irrigated via centre-pivot.

Soil Description:

Depth (cm)	*Description*
0–10	Hardsetting, cracking, black, heavy fine sandy clay loam with weak cloddy structure.
10–25	Very dark greyish brown, black and yellowish brown, medium heavy clay with weak subangular blocky parting to moderate, fine polyhedral structure.
25–60	Greyish brown, medium clay with weak subangular blocky parting to weak, fine polyhedral structure.
60–88	Very highly calcareous, very pale brown, medium clay with moderate, fine polyhedral structure and 10–20% soft carbonate segregations (20–60 mm in diameter).
88–125	Highly calcareous, pale yellow and yellowish brown, medium clay with weak subangular blocky structure.
125–140	Highly calcareous, light yellowish brown, sandy light clay with massive structure and 2–10% hard carbonate fragments (2–20 mm in diameter).
Note:	Worm channels are evident to depth.

Classification: Vertic, Calcic, Grey Dermosol; medium, non-gravelly, clay loamy/clayey, deep.

Summary of Properties

Drainage: Drainage is imperfect.

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 slightly alkaline in the surface layers to strongly alkaline in the lower subsoil.

Rooting depth: Viewed in the pit: most roots occur in the top 25 cm, with some to 88 cm.

Barriers to Root Growth:

Physical: Dispersiveness and high soil strength limit root growth with depth.

Chemical: High pH, raised levels of salts, low levels and some restricted availability of some nutrients (e.g. phosphorus and zinc), and probably low oxygen levels associated with wetness and high bulk density, may limit root growth with depth.

Waterholding capacity: High. Total available: approx 110 mm [(0.1x200)+(0.15x160)+(0.35x150)+(0.18x150x0.5)].

Seedling emergence: Moderate to 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: Moderate to poor owing to high clay content and relatively 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	8.3	7.5	0.4	0.34	2.15	1.7	30	373	190	10.4	1.6	0	1.6	228	33	3.4	17.0	10.8	4.4	0.7	1.0	0.0	0.0	4
0-10	7.6	6.7	0.3	0.22	1.78	2.0	16	308	143	7.9	1.4	0	1.3	240	33	1.7	14.5	8.3	4.4	1.0	0.8	0.0	0.0	7
10-25	7.9	6.9	0.2	0.30	2.22	0.6	4	452	285	23.0	2.4	0	1.9	115	32	0.6	20.6	9.5	7.7	2.0	1.4	0.0	0.0	10
25-60	8.8	8.0	0.4	0.42	3.33	0.3	2	440	462	45.7	8.7	0	1.7	66	46	0.6	19.6	7.6	8.1	2.6	1.3	0.0	0.0	13
60-88	9.5	8.5	4.8	0.51	3.19	0.1	2	351	431	65.3	13.0	0	0.8	6	2.7	0.4	36.3	25.0	8.2	2.2	0.9	0.0	0.0	6
88-125	9.3	8.6	5.9	0.88	4.95	0.1	2	337	730	122	12.4	0	0.4	6	1.9	0.4	28.6	17.5	7.8	2.3	0.9	0.0	0.1	8
125-140	9.3	8.6	7.6	0.69	6.33	0.1	2	261	863	102	9.6	0	0.5	7	3.8	0.5	21.6	14.8	5.0	1.2	0.5	0.0	0.1	6

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