HARD LOAM OVER RED CLAY

General Description: *Medium thickness hard setting loam sharply overlying a red coarsely structured clay with abundant soft carbonate at shallow depth, grading to soft highly weathered basement rock*

Landform: Gentle slopes between ridges and drainage depressions

Substrate: Deeply weathered siltstone (Mintaro Formation)

Vegetation:

Type Site:

Site No.:	CL026	1:50,000 mapsheet:	6629-1 (Riverton)
Hundred:	Waterloo	Easting:	310500
Section:	246	Northing:	6225250
Sampling date:	23/12/96	Annual rainfall:	485 mm average

Gentle slope of 3% at the foot of a quartzite ridge. Hard setting surface with 2-10% quartz and ironstone fragments. Sampling site in an area of poor lucerne growth.

Soil Description:

Depth (cm)	*Description*
0-10	Dark brown hard loam with weak granular structure and 2-10% ironstone gravel. Sharp to:
10-40	Dark reddish brown very hard medium heavy clay with moderate coarse prismatic breaking to strong angular blocky structure. Abrupt to:
40-85	Yellowish red highly calcareous medium clay with strong angular blocky structure and 20-50% soft carbonate segregations. Clear to:
85-175	Yellowish red highly calcareous light clay with moderate angular blocky structure, 10-20% soft carbonate segregations and 20-50% soft siltstone fragments. Gradual to:
175-250	Weathering siltstone.

Classification: Hypercalcic, Hypernatric, Red Sodosol; medium, slightly gravelly, loamy / clayey, very deep

Summary of Properties

Drainage: Water will "perch" on top of the dispersive clayey subsoil for a week or more at a time following prolonged rainfall - moderately well to imperfectly drained.

Fertility: The soil has moderate natural fertility. Data do not indicate any nutrient deficiencies, although calcium : magnesium ratio is too low (ideally 4:1), and sodium is too high. Gypsum will alleviate this problem.

pH: Neutral at the surface, strongly alkaline with depth.

Rooting depth: 85 cm at pit site, but few roots below 40 cm.

Barriers to root growth:

Physical: Hard, coarsely structured dispersive subsoil restricts uniform root penetration - roots tend to grow between aggregates but not into them.

Chemical: High salinity from 40 cm, moderately high boron, high pH, and very high sodicity from 10 cm all affect good root proliferation.

Waterholding capacity: Approximately 60 mm in the rootzone (moderate), although the occasional deeper lucerne roots will access additional moisture from lower in the profile.

Seedling emergence: Fair to poor because of the hard setting sealing surface.

Workability: Fair due to the poorly structured surface soil which has a limited moisture range for effective cultivation.

Erosion Potential:

Water: Moderate. Although the slope is gentle, the soil erodibility is high.

Wind: Low to moderately low.

Laboratory Data

Depth cm	pH H_2O	pH $CaCl_2$	CO_3 %	EC1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	SO_4 mg/kg	Boron mg/kg	Trace Elements mg/kg (EDTA)				CEC cmol (+)/kg	Exchangeable Cations cmol(+)/kg				ESP
											Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
Paddock	7.4	6.9	0	0.16	-	1.5	34	341	8.4	1.7	1.42	143	64.5	3.21	16.7	8.0	4.1	0.7	0.87	4.3
0-10	7.5	6.6	0	0.26	-	1.7	54	338	17.0	7.6	1.78	159	73.1	1.41	20.6	5.9	6.8	3.0	0.86	14.7
10-40	9.2	8.2	0	0.52	-	0.7	5	384	38.4	13.4	2.31	49.9	83.2	1.36	34.0	7.8	14.1	8.6	1.2	25.4
40-85	9.0	8.4	44	2.00	-	0.2	3	251	192	7.6	0.49	4.2	1.95	2.20	20.0	3.7	8.6	8.2	0.60	40.8
85-175	9.0	8.4	15	2.50	-	0.1	2	185	192	3.4	0.32	4.2	9.76	2.19	11.9	2.5	6.1	5.4	0.40	45.0
175-250	8.6	8.3	0	3.61	-	0.1	2	111	192	2.6	0.23	11.2	5.50	0.73	3.5	1.0	1.8	1.9	0.12	52.9

Note: Paddock sample bulked from cores (0-10 cm) taken around the pit. Note that the pit is located in a highly sodic patch, compared with the rest of the paddock.
CEC (cation exchange capacity) is 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.

Further information: DEWNR Soil and Land Program