

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 sheet: 6629-1 (Riverton) Hundred: Waterloo
 Annual rainfall: 475 mm Sampling date: 23/12/96
 Landform: Gentle slope of 3% at the foot of a quartzite ridge
 Surface: Hard setting with 2-10% quartz and ironstone fragments. Sampling site in an area of poor lucerne growth.

Soil Description:

<i>Depth (cm)</i>	<i>Description</i>
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.
Water holding capacity	Approximately 60 mm in the root zone (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 ₂ O	pH CaCl ₂	CO ₃ %	EC1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	SO ₄ -S 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.