

HARD CLAY LOAM OVER DISPERSIVE RED CLAY

General Description: *Hard setting loam to clay loam sharply overlying a red coarsely structured dispersive clay, calcareous with depth*

Landform: Gently sloping outwash fans and pediments

Substrate: Alluvial clays mixed with deeply weathered basement rock

Vegetation:



Type Site: Site No.: CL020

1:50,000 sheet:	6729-4 (Eudunda)	Hundred:	Neales
Annual rainfall:	350 mm	Sampling date:	16/03/95
Landform:	Midslope of gently undulating rise, 4% slope		
Surface:	Hard setting with no stones		

Soil Description:

<i>Depth (cm)</i>	<i>Description</i>
0-15	Reddish brown massive hard clay loam. Sharp to:
15-40	Red firm coarsely structured dispersive clay with strong coarse prismatic structure. Abrupt to:
40-60	Highly calcareous yellowish red medium clay with moderate coarse prismatic structure. Clear to:
60-100	Highly calcareous pale brown medium clay with minor siltstone fragments. Gradual to:
100-140	Highly calcareous pale brown medium clay with 20-50% siltstone fragments. Gradual to:
140-180	Slightly calcareous medium clay with 10-20% siltstone fragments. Gradual to:
180-200	Weathering siltstone.



Classification: Hypercalcic, Subnatric, Red Sodosol; medium, non-gravelly, clay loamy / clayey, deep

Summary of Properties

Drainage Moderately well drained. Water will perch on the dispersive clay subsoil for a week or so following prolonged or heavy rain.

Fertility Inherent fertility is high, as indicated by the exchangeable cation data. Favourable organic carbon levels augment nutrient retention capacity. Phosphorus levels are marginal, but other measured elements are in good supply. Zinc deficiency is possible.

pH Alkaline at the surface (road dust effect), to strongly alkaline in the subsoil.

Rooting depth 40 cm in pit

Barriers to root growth

Physical: Hard consistence of surface and subsurface layers impedes root growth. Dispersive and coarsely structured subsoil clay prevents uniform root distribution, thereby restricting water use efficiency.

Chemical: High pH, sodicity and boron from 40 cm combine to severely restrict root growth.

Water holding capacity Approximately 60 mm in rootzone.

Seedling emergence: Surface sealing is likely, leading to patchy emergence.

Workability: Temporary waterlogging (soupy soil) and rapid drying (leading to hard brittle soil) limit the time for safe working ("Sunday soil").

Erosion Potential

Water: Moderate due to high soil erodibility and gentle slope.

Wind: Moderately low to 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 (DTPA)				CEC cmol (+)/kg	Exchangeable Cations cmol(+)/kg				ESP
											Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
Paddock	8.4	7.9	0.8	0.1	0.6	1.5	23	479	17	2.9	-	-	-	-	22.3	15.89	3.85	0.44	1.63	1.9
0-15	8.5	7.9	3.5	0.1	0.7	1.6	24	443	21	3.3	-	-	-	-	24.8	19.54	4.64	0.61	1.69	2.4
15-40	9.1	8.3	1.6	0.3	0.4	0.9	<4	359	20	8.1	-	-	-	-	48.8	22.83	16.79	6.20	1.86	12.7
40-60	9.6	8.6	26.1	0.5	1.4	0.4	<4	275	42	20.8	-	-	-	-	24.2	6.50	12.91	7.03	1.11	29.0
60-100	9.7	8.7	20.2	0.7	1.8	0.1	5	214	63	23.7	-	-	-	-	18.6	3.53	10.23	6.84	0.79	36.7
100-140	9.5	8.7	2.4	0.8	2.5	0.1	<4	239	89	26.3	-	-	-	-	21.1	3.18	9.55	7.51	0.71	35.5
140-180	9.3	8.6	0.4	1.0	3.5	0.1	<4	308	127	35.5	-	-	-	-	27.4	3.48	13.29	10.45	0.99	38.1

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

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.