HARD CLAY LOAM OVER SODIC RED CLAY

General Description: *Hard setting reddish brown sandy loam to clay loam overlying a strongly structured dark reddish brown clay with soft calcareous segregations at depth, forming in fine grained rock*

Landform: Gentle to moderate slopes

Substrate: Fine grained sedimentary rock, mantled by soft secondary carbonates

Vegetation: Open savannah with scattered blue gum, peppermint, sheoak and irongrass

Type Site: Site No.: CU037

1:50,000 sheet:	6532-2 (Booleroo)	Hundred:	Booleroo
Annual rainfall:	390 mm	Sampling date:	06/06/94
Landform:	Lower slope of gently undulating rise, 2% slope		
Surface:	Hard setting with no stones		

Soil Description:

Depth (cm)	*Description*
0-10	Dark reddish brown massive clay loam. Clear to:
10-25	Light reddish brown fine sandy clay loam with weak very coarse blocky structure. Abrupt to:
25-50	Dark reddish brown medium clay with strong very coarse prismatic structure. Gradual to:
50-70	Dark reddish brown medium clay with strong very coarse prismatic structure and 2-10% siltstone fragments. Gradual to:
70-100	Yellowish red highly calcareous light medium clay with moderate subangular blocky structure, 10-20% soft carbonate segregations and 20-50% weathering siltstone fragments. Diffuse to:
100-160	Weathering siltstone with 2-10% soft carbonate segregations in cleavages.

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

Summary of Properties

Drainage Moderately well drained. The dispersive clay subsoil prevents free drainage of water which may lie on the top of the clay for periods of a week or so after rain.

Fertility Moderate to high level of natural fertility (high CEC and exchangeable calcium), but relies on organic matter for surface fertility especially nitrogen supply. Phosphorus, potassium, calcium, magnesium and trace elements appear to be adequate.

pH Slightly acidic at the surface, strongly alkaline with depth. Note that higher surface pH in pit is due to proximity to lime rubbled track.

Rooting depth 70 cm in pit.

Barriers to root growth

Physical: The hardness of the massive surface layers and the dispersive subsoil prevents roots from fully exploiting the soil.

Chemical: High boron (50-70 cm) and high pH from 50 cm limit root growth. Sodium levels may also affect some species.

Water holding capacity Approximately 100 mm, but at least a quarter of this is effectively unavailable due to inadequate root distributions.

Seedling emergence Fair to good. The poorly structured surface may seal over and cause patchy emergence.

Workability Fair. The poorly structured surface has a limited optimum moisture range for effective cultivation.

Erosion Potential

Water: Moderately low, due to the low angle slope.

Wind: Low.

Laboratory Data

Depth cm	pH H_2O	pH $CaC1_2$	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	6.4	5.8	0	0.06	0.42	1.1	38	707	-	1.7	1.0	19	21.6	3.9	11.6	6.5	2.1	0.27	1.04	2.3
0-10	7.7	7.3	0	0.10	0.53	1.4	33	835	-	2.1	0.8	7	14.0	2.1	13.6	9.8	1.5	0.15	1.34	1.1
10-25	7.9	7.2	0	0.06	0.57	0.2	5	269	-	1.3	0.7	3	4.9	0.2	8.7	6.4	1.6	0.38	0.28	4.4
25-50	8.4	7.5	0	0.15	0.51	0.5	<4	304	-	7.6	1.8	8	4.4	0.3	21.8	10.1	10.9	3.68	0.77	16.9
50-70	9.2	8.5	3.8	0.54	1.27	0.4	<4	407	-	22.4	1.4	7	1.9	0.3	30.5	7.1	17.7	7.96	1.37	26.1
70-100	9.4	8.3	35.8	0.84	3.93	0.2	4	221	-	7.4	0.4	4	0.7	0.2	16.2	3.5	8.8	5.34	0.51	33.0
100-160	9.2	8.3	23.7	0.87	4.34	<0.1	5	209	-	2.3	0.3	4	0.8	0.4	20.8	5.3	10.7	5.64	0.43	27.1

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.