HARD GRADATIONAL RED CLAY

General Description: *Hard clay loam to clay over a red coarsely structured heavy clay, calcareous with depth*

Landform: Gently undulating rises.

Substrate: Deeply weathered micaceous basement rock.

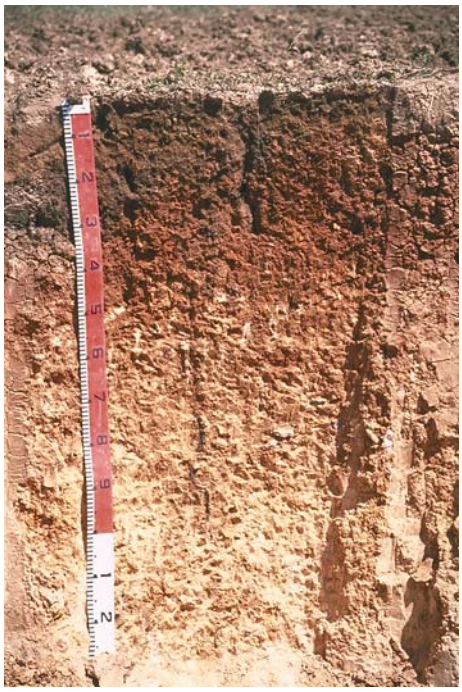
Vegetation:

Type Site: Site No.: CY007

1:50,000 sheet:	6429-2 (Ardrossan)	Hundred:	Maitland
Annual rainfall:	500 mm	Sampling date:	08/12/92
Landform:	Footslope of rise, 1% slope		
Surface:	Hard setting with minor fragments of micaceous sandstone (60-200 mm)		

Soil Description:

Depth (cm)	*Description*
0-9	Dark reddish brown very hard massive sandy light clay. Clear to:
9-31	Red very hard slightly calcareous medium heavy clay with strong coarse angular blocky structure and 2-10% quartz gravel. Gradual to:
31-48	Red firm moderately calcareous medium heavy clay with moderate coarse angular blocky structure and 2-10% quartz gravel. Gradual to:
48-85	Strong brown hard massive highly calcareous light medium clay with minor sandstone gravel. Diffuse to:
85-130	Strong brown hard massive very highly calcareous light medium clay .



Classification: Sodic, Hypercalcic, Red Dermosol; thin, non-gravelly, clayey / clayey, deep

Summary of Properties

Drainage Moderately well to imperfectly drained. The soil may remain wet for a week or two following heavy or prolonged rainfall.

Fertility The soil's natural capacity to retain nutrients is high as indicated by the exchangeable cation values. Surface fertility relies on organic matter levels which are adequate to low, and on phosphorus levels which are low at this site. Zinc appears to be deficient - tissue test required.

pH Neutral in surface (hence clovers establish better than medics), strongly alkaline at depth.

Rooting depth 65 cm in pit, but few roots below 31 cm.

Barriers to root growth

Physical: The hard coarsely structured subsoil reduces root densities.

Chemical: High pH and sodicity from 48 cm restrict deeper root growth.

Water holding capacity Approximately 100 mm in rootzone, but about a quarter is effectively unavailable due to low root density in the subsoil.

Seedling emergence: Fair, due to hard surface which tends to seal over. Organic matter levels need to be at least maintained to help preserve soil structure.

Workability: Fair to poor due to strength of clay, and dispersive nature of clay (due to high sodicity at the surface). Gypsum applications would help surface condition.

Erosion Potential

Water: Moderate

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	7.0	6.6	1	0.15	0.74	1.1	19	270	-	1.4	0.75	61	7.9	0.21	11.2	8.08	3.39	0.80	0.60	7.1
0-9	6.8	6.5	1	0.17	0.76	1.2	17	340	-	1.5	1.0	46	11	0.13	12.7	8.50	3.83	0.65	0.75	5.1
9-31	8.0	7.2	2	0.21	0.70	0.51	<2.0	310	-	4.4	1.1	22	2.0	0.09	31.4	17.4	10.6	3.68	1.00	11.7
31-48	8.9	8.1	6	0.37	0.73	0.34	<2.0	270	-	6.3	1.8	16	3.3	0.16	32.2	15.1	11.3	4.78	0.88	14.8
48-85	9.3	8.2	21	0.65	2.13	0.21	<2.0	210	-	8.3	1.4	5.5	2.2	0.11	24.7	8.47	10.3	6.37	0.64	25.8
85-130	9.5	8.3	40	1.03	3.91	0.21	<2.0	200	-	9.3	0.99	3.9	2.0	0.08	20.8	4.90	8.01	8.10	0.53	38.9

Note: Paddock sample bulked from 20 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.