IRONSTONE SOIL

General Description: *Ironstone gravelly sandy loam overlying a yellow brown clay with red mottles at depth, grading to kaolinitic weathering rock*

Landform: Upper slopes and flat crests of low hills

Substrate: Deeply weathered kaolinized sandstone or other medium to coarse grained rock

Vegetation: Open stringybark (Eucalyptus obliqua / baxteri) and blue gum (E. leucoxylon) forest

Type Site: Site No.: CH076

1:50,000 sheet:	6627-4 (Noarlunga)	Hundred:	Kuitpo
Annual rainfall:	800 mm	Sampling date:	24/11/94
Landform:	Upper slope of an undulating low hill, slope 10%		
Surface:	Firm with 2-10% ironstone gravel		

Soil Description:

Depth (cm)	*Description*
0-13	Dark greyish brown weakly structured sandy loam with 10-20% ironstone nodules. Clear to:
13-24	Bleached massive sandy loam with 20-50% ironstone nodules and quartz gravel. Abrupt to:
24-40	Orange light medium clay with moderate coarse blocky structure, and 10-20% ironstone nodules and quartz gravel. Clear to:
40-90	Yellowish brown light clay with strong fine polyhedral structure and 20-50% soft ironstone segregations. Diffuse to:
90-130	Yellow and white mottled light clay with strong blocky structure, 20-50% soft ironstone segregations and 2-10% quartz gravel. Diffuse to:
130-190	Light brown, red and white kaolinitic light clay with strong blocky structure, 10-20% soft ironstone segregations and 2-10% quartz gravel, forming in weathering sandstone.

Classification: Bleached-Ferric, Eutrophic, Brown Chromosol; medium, gravelly, loamy / clayey, deep

Summary of Properties

Drainage Moderate. A "perched" water table will form on top of the clay layer after prolonged rain, saturating the upper part of the soil for a week or more at a time.

Fertility The natural fertility of the soil is moderate (as indicated by the exchangeable cation values of the subsoil). Leaching associated with acidification is reducing the soil's fertility. The nutrient retention capacity of the low clay content surface soil is increased by organic matter (which is very high at the sampling site). Phosphorus, potassium and sulphur are all adequate. The calcium : magnesium : potassium ratios are satisfactory, but total amounts will be reduced by further acidification.

pH Strongly acidic at the surface; acidic at depth. The acidification process must be controlled to prevent further nutrient leaching and release of toxic aluminium.

Rooting depth 130 cm in pit, but very few roots below 40 cm.

Barriers to root growth

Physical: The clayey subsoil presents a minor constraint to root development.

Chemical: Low pH and possible aluminium toxicity. Moderate fertility

Water holding capacity Approximately 100 mm in root zone (high).

Seedling emergence Good, provided organic matter levels are maintained. If reduced, the surface is prone to hard setting and sealing.

Workability Good, provided organic matter levels are maintained. If reduced, the surface has a narrow moisture range for effective working.

Erosion Potential

Water: Moderate, due to the 10% 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 (EDTA)				CEC cmol (+)/kg	Exchangeable Cations cmol(+)/kg				ESP
											Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
Paddock	5.8	4.8	0	0.07	0.27	6.2	32	198	14.6	1.1	0.80	326	24.2	5.72	15.3	6.83	1.99	0.17	0.49	1.1
0-13	5.4	4.8	0	0.10	0.37	11.8	34	186	21.2	1.0	-	-	-	-	24.1	12.37	3.09	0.17	0.50	0.7
13-24	5.2	4.2	0	0.04	0.19	2.0	11	66	13.7	0.7	-	-	-	-	8.7	1.89	0.62	0.11	0.20	1.3
24-40	5.5	4.9	0	0.07	0.21	1.4	4	114	80.8	1.6	-	-	-	-	16.0	4.67	5.31	0.33	0.35	2.1
40-90	6.0	5.7	0	0.04	0.10	0.1	<4	14	254	1.4	-	-	-	-	13.5	2.77	7.42	0.43	0.13	3.2
90-130	6.1	5.4	0	0.04	0.11	0.1	<4	32	181	1.5	-	-	-	-	13.8	2.13	6.79	0.46	0.10	3.3
130-190	6.0	4.7	0	0.04	0.15	0.1	<4	12	95.6	1.1	-	-	-	-	11.9	1.24	7.29	0.56	0.10	4.7

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.