IRONSTONE SOIL

General Description: *Loamy sand becoming gradually more clayey with depth with a yellow ironstone gravelly medium textured subsoil grading to clayey kaolinitic weathering material*

Landform: Gently undulating rises.

Substrate: Deeply weathered kaolinized sandstone (Kanmantoo Group).

Vegetation: Eucalyptus cosmophylla scrub.

Type Site: Site No.: CK005

1:50,000 sheet:	6326-4 (Stokes Bay)	Hundred:	Duncan
Annual rainfall:	750 mm	Sampling date:	09/03/93
Landform:	Very gently undulating upper slope, 2%		
Surface:	Soft with no stones		

Soil Description:

Depth (cm)	*Description*
0-10	Black soft massive loamy sand. Abrupt change to:
10-30	Pale brown soft massive sandy loam. Clear to:
30-50	Very pale brown friable massive sandy clay loam. Abrupt to:
50-85	Brownish yellow, pale yellow and red very hard massive clay loam with more than 50% ironstone nodules (2-20 mm). Diffuse to:
85-140	Light grey, brownish yellow and reddish brown very hard light medium clay with weak angular blocky structure and 2-10% ironstone nodules (2-6 mm). Gradual to:
140-160	Light grey, red and brownish yellow very hard medium clay with moderate coarse prismatic structure.

Classification: Ferric-Acidic, Magnesic, Yellow Kandosol; medium, non-gravelly, sandy / clayey, very deep

Summary of Properties

Drainage Imperfectly drained. The soil may remain wet for several weeks following heavy or prolonged rainfall.

Fertility Natural fertility is low to very low, as indicated by the exchangeable cation data. The soil has a low capacity to store nutrients. Fertility relies on high organic matter levels. Phosphorus is low at the sampling site, but potassium and trace element concentrations are adequate at the surface, although low in the subsoil.

pH Acidic throughout.

Rooting depth 85 cm in pit.

Barriers to root growth

Physical: The hard weakly structured clayey subsoil impedes root growth to some extent, but does not prevent it.

Chemical: Low fertility, low capacity to retain nutrients, low subsoil trace element levels, and high phosphate fixing capacity restrict root growth. Acidity exacerbates the problem.

Water holding capacity 100 mm in root zone.

Seedling emergence: Good.

Workability: Good.

Erosion Potential

Water: Low.

Wind: Moderately low.

Laboratory Data

Depth cm	pH H_2O	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	Exch Al cmol (+)/kg
											Cu	Fe	Mn	Zn		Ca	Mg	Na	K		
Paddock	5.3	4.7	0	0.26	1.59	3.3	11	180	-	1.3	0.4	180	4.1	3.5	8.5	2.11	0.56	0.32	0.39	3.8	0.67
0-10	5.4	4.8	0	0.33	1.59	4.6	13	270	-	1.2	0.5	200	4.6	1.9	6.8	2.54	0.76	0.35	0.41	5.1	0.26
10-30	4.8	4.5	0	0.06	0.31	0.97	8	70	-	0.7	0.2	160	0.1	0.2	4.1	0.58	0.29	0.14	0.03	3.4	1.36
30-50	5.0	4.4	0	0.05	0.31	0.43	<2	47	-	0.9	0.1	51	0.1	<0.1	6.3	0.71	0.71	0.24	0.02	3.8	0.87
50-85	5.0	4.7	0	0.20	1.00	0.23	7	55	-	2.1	0.8	6	<0.1	<0.1	6.0	0.51	3.98	0.66	0.02	11.0	0.11
85-140	4.8	4.5	0	0.24	1.06	0.16	6	39	-	2.8	<0.1	4	<0.1	<0.1	7.6	0.15	4.56	1.06	0.11	13.9	0.71
140-160	4.6	4.4	0	0.25	1.25	0.13	6	39	-	3.1	<0.1	4	<0.1	<0.1	7.3	0.08	4.06	1.33	0.02	18.2	0.78

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