IRONSTONE SOIL

General Description: *Ironstone gravelly sandy loam to sandy clay loam over a yellow clayey subsoil grading to deeply weathered kaolinized weathering rock*

Landform: Undulating low hills.

Substrate: Deeply weathered kaolinized sandstone (Kanmantoo Group).

Vegetation: Stringybark, yacca and banksia closed forest.

Type Site:

Site No.:	CK007		
1:50,000 sheet:	6226-1 (Snug Cove)	Hundred:	Gosse
Annual rainfall:	900 mm	Sampling date:	24/02/94
Landform:	Upper slope of 5%		
Surface:	Soft with no stones		

Soil Description:

Depth (cm)	*Description*
0-9	Dark brown soft fine sandy loam with moderate granular structure, 2-10% ironstone gravel (6-20 mm), and 2-10% quartz gravel (6-20 mm). Clear change to:
9-28	Yellowish brown friable massive light sandy clay loam with 20-50% ironstone gravel (6-20 mm). Clear change to:
28-70	Olive yellow very hard silty medium clay with moderate coarse prismatic structure. Gradual change to:
70-137	Pale yellow, olive yellow and red very hard silty medium clay with weak coarse prismatic structure and 2-10% quartz gravel (20-60 mm). Gradual change to:
137-180	White, red and olive yellow firm massive silty light medium clay with minor quartz gravel (20-60 mm).

Classification: Ferric, Mesotrophic, Yellow Chromosol; medium, slightly gravelly, loamy / clayey, very deep

Summary of Properties

Drainage Imperfectly drained, due to the low permeability clay subsoil at relatively shallow depth. The soil may remain wet for several weeks following heavy or prolonged rainfall.

Fertility Natural fertility is low, as indicated by the exchangeable cation data. Surface fertility relies on organic carbon being maintained above 2%. Ironstone gravel ties up phosphorus, concentrations of which are low at the sampling site. Potassium and zinc levels are marginal.

pH Acidic at the surface, strongly acidic at depth.

Rooting depth Approximately 70 cm in pit, but few roots below 28 cm.

Barriers to root growth

Physical: The tight clay subsoil restricts uniform root growth. Waterlogging exacerbates the problem.

Chemical: Possible acidity induced toxicities (eg aluminium), and low trace element levels at depth limit root growth.

Water holding capacity 90 mm in root zone, but some is effectively unavailable due to low subsoil root density.

Seedling emergence: Good, provided surface organic matter is maintained.

Workability: Good to fair - ironstone is abrasive.

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 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	5.5	4.8	0	0.09	0.44	5.2	16	100	-	0.6	0.2	274	2.1	0.3	9.7	4.75	1.12	0.30	0.27	3.1
0-9	5.4	4.7	0	0.14	0.70	5.8	16	133	-	0.6	0.5	360	2	0.6	10.1	4.87	1.49	0.20	0.39	2.0
9-28	5.7	4.8	0	0.02	0.11	1.2	5	38	-	0.4	0.2	55	0.2	0.2	3.8	1.06	0.35	0.17	0.10	4.5
28-70	5.8	5.4	0	0.05	0.16	0.4	<4	49	-	0.9	<0.1	4	0.1	0.1	4.7	1.36	2.05	0.24	0.16	5.1
70-137	5.2	4.4	0	0.04	0.15	0.1	<4	87	-	0.7	<0.1	1	0.1	0.1	3.8	0.67	1.20	0.21	0.24	5.5
137-180	4.9	4.3	0	0.04	0.13	0.0	<4	44	-	0.5	<0.1	1	<0.1	0.1	2.4	0.57	0.70	0.16	0.12	6.7

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