

IRONSTONE SOIL

General Description: *Very thick ironstone gravelly sandy loam over a brown clay, kaolinitic with depth*

Landform: Gently undulating plateau surface.

Substrate: Deeply weathered kaolinized basement sandstone (Kanmantoo Group).

Vegetation:



Type Site: Site No.: CK009

1:50,000 sheet:	6326-4 (Stokes Bay)	Hundred:	Cassini
Annual rainfall:	750 mm	Sampling date:	24/02/94
Landform:	Very gentle slope (1%) on plateau surface		
Surface:	Firm to soft with no stones		

Soil Description:

<i>Depth (cm)</i>	<i>Description</i>
0-5	Very dark brown soft massive loamy fine sand with 2-10% ironstone gravel (2-6 mm). Abrupt to:
5-21	Yellowish brown and dark brown soft massive light sandy loam with 10-20% ironstone gravel (2-20 mm). Gradual to:
21-40	Yellowish brown soft massive light sandy loam with 20-50% ironstone gravel (6-20 mm). Gradual to:
40-89	Yellowish brown soft massive light sandy loam with more than 90% ironstone gravel (6-60 mm). Clear to:
89-115	Strong brown and pale yellow very hard medium clay with moderate angular blocky structure and 10-20% ironstone gravel (6-20 mm). Diffuse to:
115-155	Strong brown, light grey and red very hard silty medium clay with moderate angular blocky structure.



Classification: Bleached-Ferric, Eutrophic, Brown Chromosol; very thick, slightly gravelly, sandy/clayey, deep

Summary of Properties

Drainage	Imperfectly drained, due to low permeability clay subsoil. Soil may remain wet for several weeks following heavy or prolonged rainfall.
Fertility	Natural fertility is moderate to low, as indicated by the exchangeable cation data. Nutrient retention capacity is satisfactory, but relies on high surface organic matter levels (more than 2% organic carbon). Ironstone gravel ties up phosphorus, but concentrations are high at sampling site. Levels of other tested elements appear to be satisfactory.
pH	Acidic throughout.
Rooting depth	Approximately 90 cm in pit.
Barriers to root growth	
Physical:	The hard clayey subsoil restricts root growth to some extent, but at 90 cm depth, effects are minimal.
Chemical:	Phosphorus fixation by ironstone and subsoil trace element deficiencies limit deep root growth.
Water holding capacity	40 mm in root zone. Soil volume reduced by ironstone gravel.
Seedling emergence:	Good, provided surface organic matter is maintained.
Workability:	Fair to good - ironstone is abrasive.
Erosion Potential	
Water:	Low.
Wind:	Moderately low.

Laboratory Data

Depth cm	pH H ₂ O	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
											Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
Paddock	5.8	5.2	0	0.29	1.82	5.1	60	556	-	1.2	0.8	93	2.8	1.8	12.9	7.54	2.08	0.22	1.48	1.7
0-5	5.9	5.3	0	0.49	2.19	6.0	47	1034	-	1.6	0.5	73	4.4	2.6	14.2	8.01	2.21	0.24	2.05	1.7
5-21	6.0	5.0	0	0.05	0.40	1.8	11	220	-	0.5	0.2	56	0.3	0.3	6.6	3.08	0.55	0.21	0.61	3.2
21-40	6.3	5.3	0	0.03	0.15	0.5	4	103	-	0.3	0.1	47	0.1	0.2	3.5	1.58	0.60	0.15	0.34	4.3
40-89	6.5	5.5	0	0.02	0.13	3.8	<4	107	-	0.5	<0.1	5	<0.1	0.1	4.5	1.51	1.51	0.18	0.37	4.0
89-115	5.9	5.3	0	0.05	0.13	0.1	<4	82	-	2.0	<0.1	2	<0.1	0.1	9.3	1.94	6.41	0.45	0.36	4.8
115-155	5.2	4.4	0	0.04	0.11	0.1	<4	20	-	1.6	<0.1	1	<0.1	0.1	6.6	0.93	3.52	0.31	0.16	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