

IRONSTONE SOIL

General Description: *Dark loamy sand with a paler ironstone gravelly sandy loam to light sandy clay loam A2 horizon over a yellow or brown clayey subsoil, grey, red and brown mottled with depth*

Landform: Gently undulating plateau (summit surface).

Substrate: Deeply weathered kaolinitic sandstone (Kanmantoo Group).

Vegetation: Stringybark and yacca with reeds in wet hollows.



Type Site: Site No.: CK008

1:50,000 sheet:	6326-4 (Stokes Bay)	Hundred:	Duncan
Annual rainfall:	850 mm	Sampling date:	24/02/94
Landform:	Very gentle slope of 1% on plateau surface		
Surface:	Firm with no stones		

Soil Description:

Depth (cm)	Description
0-2	Black loose loamy sand with minor ironstone gravel. Abrupt to:
2-14	Dark brown soft massive light sandy loam with 2-10% ironstone (6-20 mm) and minor quartz gravel (2-20 mm). Clear to:
14-40	Yellowish brown friable massive sandy loam with 20-50% ironstone (6-60 mm) and minor quartz gravel (2-20 mm). Gradual to:
40-65	Light olive brown soft massive light fine sandy clay loam with more than 50% ironstone gravel (6-200 mm). Clear to:
65-95	Light yellowish brown and strong brown very hard medium clay with moderate angular blocky structure, 2-10% ironstone (20-200 mm) and 2-10% quartz gravel (6-60 mm). Gradual to:
95-135	Light grey, strong brown and red very hard silty light clay with weak coarse prismatic structure.



Classification: Ferric, Mesotrophic, Yellow Kurosol; very thick, non-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 low, as indicated by the exchangeable cation data. Nutrient retention capacity is poor and base saturation is low (46% in upper subsoil). Surface nutrient retention relies on organic matter – organic carbon needs to be above 2%. Ironstone gravel ties up phosphorus, levels of which are very low at the sampling site. Potassium concentrations are also low.
pH	Acidic at the surface, strongly acidic at depth.
Rooting depth	Approximately 80 cm in pit.
Barriers to root growth	
Physical:	The hard clayey subsoil retards root growth.
Chemical:	Phosphate fixation, subsoil trace element deficiencies and acidity restrict root growth.
Water holding capacity	65 mm in root zone. Soil volume reduced by ironstone gravel.
Seedling emergence:	Good, provided surface organic matter is maintained. Water repellence may be a problem in some seasons.
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	5.5	4.6	0	0.05	0.35	2.6	6	31	-	0.3	0.6	177	0.4	1.4	5.5	2.22	0.48	0.17	0.19	3.1
0-2	5.8	4.9	0	0.09	0.73	4.0	8	283	-	0.6	1	129	4.1	3.2	7.8	3.75	1.24	0.18	0.44	2.3
2-14	5.3	4.3	0	0.03	0.24	2.2	<4	13	-	0.3	0.2	116	0.2	0.4	4.4	1.72	0.36	0.14	0.12	3.2
14-40	5.8	4.9	0	0.02	0.11	1.0	<4	4	-	0.5	<0.1	33	0.1	0.1	3.1	0.66	0.31	0.14	0.11	4.5
40-65	5.7	4.7	0	0.02	0.11	1.0	<4	13	-	0.5	<0.1	25	0.1	0.2	3.8	0.74	0.59	0.16	0.16	4.2
65-95	5.2	4.3	0	0.03	0.10	0.4	<4	37	-	0.8	<0.1	8	<0.1	0.1	6.0	0.55	1.70	0.22	0.31	3.7
95-135	4.9	4.2	0	0.03	0.10	0.1	<4	5	-	0.5	<0.1	2	<0.1	0.1	6.2	0.24	0.84	0.15	0.15	2.4

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