

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 mapsheet:	6326-4 (Stokes Bay)
	Hundred:	Duncan	Easting:	685450
	Section:	1	Northing:	6034600
	Sampling date:	24/2/94	Annual rainfall:	795 mm average

Very gentle slope of 1% on plateau surface. Firm surface 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.
- Waterholding capacity:** 65 mm in rootzone. 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 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

Further information: [DEWNR Soil and Land Program](#)

