

IRONSTONE SOIL

General Description: *Ironstone gravelly loamy sand to sandy loam over a brown clayey subsoil, kaolinitic with depth*

Landform: Undulating rises.

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

Vegetation:



Type Site: Site No.: CK010

1:50,000 sheet: 6326-1 (Cassini)

Hundred: MacGillivray

Annual rainfall: 575 mm

Sampling date: 25/02/94

Landform: Upper slope (1%) of undulating rise

Surface: Soft to firm with no stone

Soil Description:

Depth (cm)	Description
0-7	Very dark brown soft light fine sandy loam with 10-20% ironstone gravel (2-6 mm). Abrupt to:
7-38	Dark yellowish brown soft massive light fine sandy loam with more than 50% ironstone gravel (6-60 mm). Clear to:
38-53	Yellowish brown very hard medium clay with weak subangular blocky structure and 10-20% ironstone gravel (6-20 mm). Gradual to:
53-79	Yellowish brown and light brownish grey very hard medium clay with moderate angular blocky structure and 10-20% ironstone gravel (6-20 mm). Gradual to:
79-120	Yellowish brown, light grey and red extremely hard medium clay with moderate angular blocky structure and minor ironstone gravel. Diffuse to:
120-135	Yellowish brown, red and light grey very hard medium clay with weak angular blocky structure.



Classification: Ferric-Sodic, Eutrophic, Brown Chromosol; thick, gravelly, loamy / clayey, deep

Summary of Properties

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

Fertility Natural fertility is moderate, as indicated by the exchangeable cation data. Nutrient retention capacity is boosted by high surface organic matter levels. Ironstone ties up phosphorus, although levels are high at the sampling site. Concentrations of other tested elements (nitrogen excluded) are satisfactory. Potassium level is good.

pH Acidic throughout.

Rooting depth Approximately 60cm in pit.

Barriers to root growth

Physical: Temporary waterlogging.

Chemical: Phosphorus fixation by ironstone. High exchangeable sodium at depth.

Water holding capacity 45mm in pit. 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	5.7	5.3	0	0.30	1.89	5.7	54	649	-	1.8	1	143	3.0	0.8	18.5	12.6	2.15	0.20	1.82	1.1
0-7	7.0	6.6	0.2	0.24	1.17	7.3	67	521	-	1.7	0.8	89	3.3	1.2	26.7	26.0	2.65	0.26	1.43	1.0
7-38	5.9	4.9	0	0.04	0.18	1.1	11	240	-	1.0	0.2	87	0.1	0.2	8.5	3.52	1.45	0.24	0.78	2.8
38-53	6.8	5.9	0	0.04	0.19	0.4	<4	167	-	2.8	0.1	6	<0.1	0.2	9.7	3.36	4.39	0.33	0.59	3.4
53-79	6.6	6.1	0	0.09	0.25	0.1	<4	83	-	3.8	<0.1	2	<0.1	0.1	13.6	3.84	8.30	0.82	0.41	6.0
79-120	5.8	5.2	0	0.16	0.47	0.1	<4	25	-	4.0	<0.1	1	<0.1	0.1	13.2	3.67	8.76	1.54	0.24	11.7
120-135	5.6	4.9	0	0.35	1.51	0.2	<4	8	-	6.8	<0.1	1	<0.1	0.1	14.3	3.85	8.96	3.13	0.17	21.9

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