

IRONSTONE SOIL

General Description: *Ironstone gravelly sandy loam grading to a sandy clay loam over a brown, yellow and red clay, becoming grey mottled with depth*

Landform: Plateau (summit surface) of undulating rises.

Substrate: Deeply weathered kaolinized basement sandstone.

Vegetation:



Type Site:	Site No.:	CK004	1:50,000 mapsheet:	6326-3 (Vivonne)
	Hundred:	Seddon	Easting:	700350
	Section:	12	Northing:	6024300
	Sampling date:	9/3/93	Annual rainfall:	615 mm average

Very gently undulating summit surface, 1% slope. Firm surface with no surface stone.

Soil Description:

Depth (cm)	Description
0-10	Dark brown soft massive fine sandy loam with 20-50% ironstone nodules (2-20 mm). Abrupt change to:
10-25	Strong brown friable massive fine sandy clay loam with more than 50% ironstone nodules (2-20 mm). Clear change to:
25-45	Brownish yellow firm massive light clay with 10-20% ironstone nodules (2-6 mm). Clear change to:
45-70	Yellowish brown, pale brown and red hard medium clay with strong fine polyhedral structure. Gradual change to:
70-110	Brownish yellow, light brownish grey and red very hard medium clay with moderate coarse prismatic breaking to fine polyhedral structure, and 2-10% ironstone fragments. Diffuse change to:
110-170	Light grey, red and yellowish brown very hard medium clay with coarse angular blocky structure and 2-10% ironstone fragments.



Classification: Ferric-Acidic, Mesotrophic, Brown Dermosol; medium, moderately gravelly, loamy/clayey, deep



Summary of Properties

- Drainage:** Moderately well to imperfectly drained. The soil may remain wet for a week to several weeks following heavy or prolonged rainfall.
- Fertility:** Natural fertility is low, as indicated by the subsoil CEC values. High surface organic matter levels help maintain surface fertility. High ironstone ties up phosphorus, levels of which are low at the sampling site. Acidification is further lowering soil fertility. Potassium and trace element concentrations are adequate in surface soil.
- pH:** Acidic at surface, strongly acidic at depth.
- Rooting depth:** 70 cm in pit, but few roots below 45 cm.
- Barriers to root growth:**
- Physical:** The hard clayey subsoil limits root growth to some extent.
 - Chemical:** Low fertility, phosphorus fixation, aluminium toxicity due to acidity and possible subsoil trace element deficiencies restrict root growth.
- Waterholding capacity:** 90 mm in rootzone, but about 20 mm effectively unavailable due to low root density.
- Seedling emergence:** Good, provided that surface organic matter levels are maintained.
- Workability:** Fair due to abrasive effects of ironstone gravel.
- Erosion Potential:**
- Water:** Low.
 - Wind:** 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	Exch Al cmol (+)/kg
											Cu	Fe	Mn	Zn		Ca	Mg	Na	K		
Paddock	5.2	4.9	0	0.72	4.07	4.0	13	430	-	2.1	0.4	220	4.1	3.5	13.6	5.79	1.96	0.42	1.01	3.1	0.12
0-10	5.5	5.2	0	0.24	1.32	4.4	10	530	-	2.3	0.5	210	4.6	1.9	17.9	9.14	3.13	0.42	1.27	2.3	0.05
10-25	6.0	5.5	0	0.07	0.44	0.62	4	270	-	1.5	0.1	26	0.1	0.2	6.0	2.03	1.59	0.29	0.47	4.8	0.05
25-45	4.7	4.5	0	0.42	2.11	0.48	<2	200	-	3.3	0.1	5	0.1	<0.1	8.2	1.84	3.56	0.51	0.45	6.2	1.12
45-70	4.3	4.1	0	0.87	4.33	0.20	<2	78	-	6.3	<0.1	1	<0.1	<0.1	8.7	0.75	3.86	1.57	0.14	18.0	3.87
70-110	4.5	4.3	0	1.18	5.56	0.25	<2	70	-	11.0	<0.1	1	<0.1	<0.1	9.3	0.64	5.00	2.61	0.13	28.1	1.92
110-170	4.9	4.8	0	1.85	9.21	0.23	<2	110	-	14.5	<0.1	1	<0.1	<0.1	12.0	0.82	6.35	4.85	0.30	40.4	0.31

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](#)

