

IRONSTONE SOIL

General Description: *Ironstone gravelly sandy loam, becoming more clayey with depth and grading to a yellow and brown mottled finely structured clayey subsoil, with grey mottles from 50 cm*

Landform: Gently undulating rises.

Substrate: Deeply weathered kaolinized metamorphosed fine sandstone of the Kanmantoo Group of rocks.

Vegetation:



Type Site:	Site No.:	CK025	1:50,000 mapsheet:	6326-3 (Vivonne)
	Hundred:	Newland	Easting:	695410
	Section:	66	Northing:	6020470
	Sampling date:	08/01/08	Annual rainfall:	625 mm average

Midslope of gently undulating rise, 2% slope. Firm surface with many ironstone nodules to 20 mm

Soil Description:

<i>Depth (cm)</i>	<i>Description</i>
0-5	Very dark greyish brown (10YR3/2) friable massive sandy loam with 40-50% ironstone nodules (2-20 mm).
5-16	Dark yellowish brown (10YR4/6) firm light fine sandy clay loam with weak fine polyhedral structure and 50-60% ironstone nodules (2-20 mm).
16-35	Yellowish brown (10YR5/6) hard light clay with weak fine polyhedral structure and 25-35% ironstone nodules (2-20 mm).
35-50	Brownish yellow (10YR6/8), yellowish brown (10YR5/6) and strong brown (7.5YR5/8) hard medium clay with moderate fine polyhedral structure.
50-65	Brownish yellow (10YR6/8), light brownish grey (2.5Y6/2) and strong brown (7.5YR5/6) very hard light clay with moderate subangular blocky structure and 10-20% ironstone fragments (20-60 mm).
65-100	As for 50-65 cm.



Classification: Ferric-Sodic, Eutrophic, Yellow Dermosol; thin, moderately gravelly, loamy / clayey, deep



Summary of Properties

Drainage:	Moderately well to imperfectly drained. The upper subsoil is likely to remain saturated for a week to several weeks following heavy or prolonged rainfall.
Fertility:	Inherent fertility is moderately low, as indicated by the exchangeable cation data. A significant proportion of the topsoil nutrient retention capacity is attributable to organic matter. Kaolinitic clays, characteristic of ironstone soils have low nutrient retention capacity. Heavy ironstone fixes phosphorus – levels of available P are low, and the reactive iron data confirms high fixation capacity. Leaf analyses are needed to confirm apparently marginal levels of copper, zinc and manganese.
pH:	Acidic throughout.
Rooting depth:	Most root growth is likely in the upper 50 cm.
Barriers to root growth:	
Physical:	High strength in the deep subsoil may restrict root growth to some extent.
Chemical:	Very low nutrient availability below 50 cm restricts growth of crop and pasture species. There are no toxic chemical constraints.
Waterholding capacity:	Approximately 55 mm in the potential rootzone
Seedling emergence:	Satisfactory
Workability:	Satisfactory, although ironstone is highly abrasive.
Erosion Potential:	
Water:	Low
Wind:	Low

Laboratory Data

Depth cm	pH H ₂ O	pH CaCl ₂	CO ₃ %	EC 1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	Cl mg/kg	SO ₄ -S mg/kg	Boron mg/kg	React Fe mg/kg	Trace Elements mg/kg (EDTA)				Sum cations cmol (+)/kg	Exchangeable Cations cmol(+)/kg				Est. ESP
													Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
0-5	6.1	5.1	0	0.10	-	5.44	13	527	55	6	1.3	2093	0.79	368	6.51	1.82	13.6	7.88	3.86	0.50	1.31	3.7
5-16	6.2	5.2	0	0.08	-	3.05	6	482	57	6	1.1	2163	0.51	317	1.23	0.76	9.9	5.85	2.23	0.55	1.23	5.6
16-35	6.6	5.6	0	0.06	-	0.55	2	151	65	7	0.9	608	0.31	76	0.73	0.22	4.7	1.62	2.10	0.61	0.37	13.0
35-50	6.6	5.8	0	0.12	-	0.74	1	288	133	17	1.9	557	0.31	66	0.62	0.24	12.2	3.30	6.60	1.54	0.72	12.7
50-65	6.5	5.8	0	0.14	-	0.39	1	258	207	81	1.8	365	0.31	337	1.38	0.05	11.0	2.62	6.40	1.31	0.66	11.9
65-100	5.7	5.0	0	0.13	-	0.28	1	232	223	103	2.7	360	0.30	271	0.60	0.06	10.2	1.61	6.62	1.43	0.57	14.0

Note: Sum of cations, in a neutral to alkaline soil, approximates the CEC (cation exchange capacity), 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, in this case estimated by the sum of cations.

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

