

# IRONSTONE LOAMY SAND OVER RED MOTTLED CLAY

**General Description:** *Thick ironstone gravelly loamy sand over a red and yellow clay, becoming greyer with depth, over an iron and silica cemented pan*

**Landform:** Undulating rises.

**Substrate:** Medium to fine grained Tertiary sediments, partly indurated to ferricrete and silcrete.

**Vegetation:**



**Type Site:** Site No.: CH140  
 1:50,000 sheet: 6627-4 (Noarlunga) Hundred: Willunga  
 Annual rainfall: 650 mm Sampling date: 17/01/05  
 Landform: Upper slope of an undulating rise, 5% slope  
 Surface: Soft with 2-10% surface ironstone to 60 mm

**Soil Description:**

Depth (cm)	Description
0-17	Dark reddish brown soft single grain loamy sand with 2-10% ironstone gravel to 20 mm. Clear to:
17-42	Reddish yellow soft single grain loamy sand with more than 50% ironstone gravel to 60 mm. Abrupt to:
42-75	Red, yellowish brown, and brownish yellow very hard sandy medium clay with strong medium angular blocky structure and 20-50% soft ferruginous segregations. Clear to:
75-100	Dark red, light grey and yellowish brown very hard sandy heavy clay with weak very coarse prismatic structure and 10-20% soft ferruginous segregations. Clear to:
100-125	Light grey, dark red and brownish yellow very hard weakly blocky sandy medium clay with 20-50% ironstone nodules to 60 mm. The layer is partly cemented to massive ferricrete and silcrete.



**Classification:** Ferric, Petroferric, Red Kurosol; thick, slightly gravelly, sandy / clayey, deep

## Summary of Properties

**Drainage:** Well drained. Water may perch on top of the clayey subsoil for a few days following heavy or prolonged rainfall.

**Fertility:** Inherent fertility is moderately low, as indicated by the exchangeable cation data. Most surface nutrient retention capacity is attributable to organic matter. Frequent nutrient monitoring and fertilizer applications are necessary. The ironstone gravel tends to tie up phosphorus. Concentrations of all tested elements, except potassium, are satisfactory.

**pH:** Neutral at the surface, strongly acidic with depth.

**Rooting depth:** 100 cm in sampling pit, but few roots below 75 cm.

### Barriers to root growth:

**Physical:** The hard clayey subsoil restricts root growth to some extent, while the underlying cemented material prevents virtually all growth.

**Chemical:** There are no apparent chemical barriers except for low nutrient status / retention capacity in the strongly acidic deep subsoil.

**Water holding capacity:** (Estimates for potential root zone of grape vines)

Total available: 95 mm

Readily available: 45 mm

**Seedling emergence:** Satisfactory.

**Workability:** Satisfactory, although ironstone gravel is hard on equipment.

### Erosion Potential

**Water:** Moderate, due to the slope and moderately high soil erodibility.

**Wind:** Moderately low.

## Laboratory Data

Depth cm	pH H <sub>2</sub> O	pH CaCl <sub>2</sub>	CO <sub>3</sub> %	EC 1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	Cl mg/kg	SO <sub>4</sub> -S mg/kg	Boron mg/kg	Trace Elements mg/kg (EDTA)				Sum cations cmol (+)/kg	Exchangeable Cations cmol(+)/kg				Est. ESP
												Cu	Fe	Zn	Mn		Ca	Mg	Na	K	
0-17	7.4	6.8	0	0.054	0.45	1.09	31	65	31	5.1	0.5	5.03	73	7.24	43.5	6.9	6.18	0.49	0.07	0.19	1.0
17-42	6.7	6.2	0	0.022	0.36	0.17	3	19	11	4.3	0.2	0.47	56	0.46	3.47	1.6	1.20	0.28	0.06	0.03	na
42-75	5.3	4.5	0	0.105	0.92	0.14	2	26	53	87.8	0.8	0.53	19	0.38	2.10	6.1	3.44	2.23	0.39	0.07	6.4
75-100	4.4	3.9	0	0.159	1.08	0.15	2	33	111	39.2	0.8	0.41	29	0.18	1.64	6.6	2.32	3.57	0.60	0.09	9.1
100-125	4.6	3.9	0	0.102	0.99	0.10	2	31	118	11.2	0.7	0.44	45	0.25	3.12	5.7	1.93	2.92	0.74	0.09	13.0

**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.