IRONSTONE SOIL

General Description: *Medium thickness ironstone gravelly sandy loam, with a bleached A2 layer over a brown and red clay, with increasing grey mottles at depth, grading to kaolinized weathered rock*

Landform: Upper slopes and plateaux of undulating to rolling rises and low hills.

Substrate: Kaolinized weathered coarse grained basement rock (gneiss at this site). This 'pallid' zone may extend many metres below the soil.

Vegetation:

Type Site:

Site No.:	CH168	1:50,000 mapsheet:	6628-1 (Barossa)
Hundred:	Para Wirra	Easting:	315850
Section:	154	Northing:	6154930
Sampling date:	03/01/07	Annual rainfall:	715 mm average

Summit surface of undulating rise, 2% slope. Hard setting surface with 10-20% ironstone pebbles (6-20 mm).

Soil Description:

Depth (cm)	Description
0-5	Dark brown hard massive light sandy loam with 20-50% ironstone nodules (to 20 mm) Clear to:
5-15	Pinkish grey firm massive light sandy loam with more than 50% ironstone nodules to 20 mm. Abrupt to:
15-30	Strong brown, yellowish red and red hard medium clay with strong medium angular blocky structure and 2-10% ironstone nodules to 60 mm. Gradual to:
30-70	Yellowish brown, red and light grey hard medium clay with strong medium angular blocky, breaking to fine angular blocky structure and 2-10% ironstone nodules to 60 mm. Diffuse to:
70-100	Light grey, red and yellowish brown very hard light medium clay with moderate coarse prismatic structure and 20-50% ironstone nodules to 60 mm. Diffuse to:
100-145	Light brownish grey and red extremely hard massive sandy light clay with 20-50% ironstone nodules to 60 mm.

Classification: Bleached-Ferric, Mesotrophic*, Brown Chromosol; medium, moderately gravelly, loamy / clayey, very deep
          *   Assumes clay content of subsoil exceeds 55%

Summary of Properties

Drainage: Moderately well to imperfectly drained. The subsoil clay may perch water for a week or two at a time following heavy or prolonged rainfall.

Fertility: Inherent fertility is low, as indicated by the exchangeable cation data. Data are indicative of natural fertility levels, highlighted by very low phosphorus and copper, and marginal potassium, sulphur, zinc and manganese. Calcium and magnesium are also likely to be deficient. Moderate to high reactive iron levels indicate phosphate fixation potential

pH: Acidic at the surface, strongly acidic with depth.

Rooting depth: 130 cm in sampling pit, but few roots below 70 cm.

Barriers to root growth:

Physical: The deep subsoil is poorly structured, but is too deep to impact on annual plants. There is some restriction to root growth of perennials.

Chemical: Low nutrient status due to extreme leaching, is the main limitation. Aluminium toxicity is likely to increase with depth

Waterholding capacity: Approximately 90 mm in the potential rootzone.

Seedling emergence: Fair due to hard setting surface.

Workability: Surface is relatively easily worked, but ironstone gravel is highly abrasive.

Erosion Potential:

Water: Moderately low.

Wind: Low.

Laboratory Data

Depth cm	pH H_2O	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	Cu	Fe	Mn	Zn	Sum cations cmol (+)/kg	Ca	Mg	Na	K	Est. ESP
0-5	5.9	4.7	0	0.03	0.33	1.50	3	123	11	6.2	0.4	903	0.4	158	17.9	1.02	2.7	1.87	0.45	0.06	0.28	2.3
5-15	6.0	4.9	0	0.02	0.21	0.82	2	60	5	2.8	0.2	433	0.42	53	2.36	1.1	1.8	1.26	0.37	0.04	0.16	2.2
15-30	6.2	5.0	0	0.03	0.11	0.71	3	78	9	5	0.8	705	0.19	38	0.72	0.34	8.3	3.19	4.74	0.17	0.23	2.0
30-70	6.1	5.3	0	0.03	0.07	0.29	4	60	10	40.4	1	512	0.05	26	0.38	0.24	8.7	2.45	5.88	0.20	0.19	2.3
70-100	5.3	4.3	0	0.03	0.11	0.18	2	36	15	47.3	0.8	434	0.21	23	1.39	0.13	4.4	0.88	3.22	0.23	0.10	5.2
100-145	5.0	3.9	0	0.10	0.60	0.14	2	32	101	39.8	0.4	387	0.09	29	1.63	0.13	4.8	0.35	3.33	1.03	0.09	21.5

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