IRONSTONE SOIL

General Description: *Ironstone gravelly sandy loam to clay loam, overlying a yellowish brown gravelly sandy clay loam to light clay becoming more clayey and containing ironstone boulders with depth, over kaolinitic weathering rock.*

Landform: Flat to gently sloping crests and upper slopes

Substrate: Highly weathered metasandstones of the Kanmantoo Group, southern Mt. Lofty Ranges.

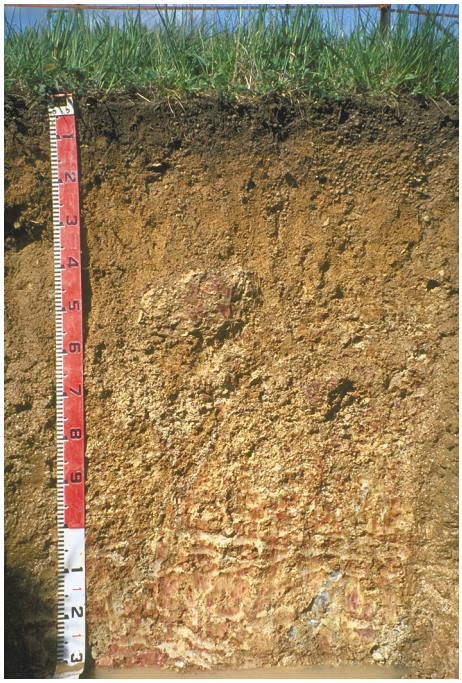
Vegetation: Eucalyptus baxteri / E. fasciculosa scrub

Type Site:

Site No.:	CH019	1:50,000 mapsheet:	6526-1 (Torrens Vale)
Hundred:	Yankalilla	Easting:	260450
Section:	294	Northing:	6061600
Sampling date:	31/07/92	Annual rainfall:	850 mm average

Flat crest of rolling low hills, 1% slope. Firm surface with trace of ironstone gravel.

Soil Description:



Depth (cm)	*Description*
0-10	Dark brown weakly granular clay loam with 10-20% ironstone (ferricrete) nodules. Abrupt to:
10-21	Orange weakly structured light clay with 20-50% ironstone nodules. Clear to:
21-40	Yellowish brown weakly structured light clay with 20-50% ironstone nodules and minor quartz gravel. Clear to:
40-60	Orange and pale yellow light medium clay with moderate polyhedral structure and 20-50% ironstone nodules and larger stones, and minor quartz gravel. Gradual to:
60-140	Pale yellow, orange and red light clay with more than 50% large ironstone fragments and broken sheets.

Classification: Ferric-Acidic, Petroferric, Brown Kandosol; medium, gravelly, clay loamy / clayey, deep

Summary of Properties

Drainage: Imperfectly drained, due to the thickness of clayey soil and the flat terrain. The soil may remain wet for several weeks.

Fertility: Moderate to low natural fertility as indicated by the exchangeable cation data for the non organic fraction. Test data indicate marginal deficiencies of magnesium, potassium, manganese and copper. Phosphorus levels are sub-optimal - the high fixation potential of the iron rich soil is an on going problem.

pH: Acidic at the surface, becoming slightly more acidic with depth. Dolomite is needed to correct the problem and reduce the high calcium / magnesium ratio.

Rooting depth: 80 cm, but few roots below 60 cm.

Barriers to root growth:

Physical: No physical barriers, except where sheets of ironstone occur. Waterlogging affects root development during winter.

Chemical: Marginal fertility, acidity and high content of ironstone.

Waterholding capacity: 50 mm, but effectively available water may be considerably less due to poor root growth caused by near surface waterlogging followed by rapid drying of the soil.

Seedling emergence: Good to fair. Soil will seal if organic matter is too low.

Workability: Good, except where surface stone and gravel cause excessive wear on points.

Erosion Potential:

Water: Low.

Wind: Low.

Laboratory Data

Depth cm	pH H_2O	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
											Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
Paddock	5.7	5.3	0	0.11	-	5.1	22	130	-	1.1	0.7	161	2.2	6.6	14.7	10.0	1.6	0.19	0.32	1.3
											*1.1	*193	*4.3	*5.1						
0-10	6.0	5.5	0	0.07	0.27	4.2	9	190	-	1.1	0.3	105	1.8	4.2	14.2	8.9	1.7	<0.1	0.45	<1.0
10-21	5.6	5.0	0	0.05	0.11	1.1	<2	130	-	1.1	0.8	34	0.1	0.2	9.2	3.7	2.2	0.17	0.30	1.8
21-40	5.2	4.6	0	0.06	0.09	0.7	<2	73	-	1.3	<0.1	10	<0.1	<0.1	9.2	2.2	3.4	0.26	0.21	2.8
40-60	5.2	4.7	0	0.06	-	0.5	<2	29	-	1.6	<0.1	6	<0.1	<0.1	10.4	1.5	7.4	0.42	0.19	4.0
60-140	4.9	4.4	0	0.06	-	0.1	<2	5	-	1.3	<0.1	3	<0.1	<0.1	6.0	<0.4	3.4	0.31	0.05	5.2

Note: Paddock sample bulked from 20 cores (0-10 cm) taken around the pit.
* EDTA trace element analyses for "paddock" sample.
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