ACIDIC LOAM OVER RED CLAY ON KAOLINIZED ROCK

General Description: *Loamy to clay loamy surface soil overlying a yellowish red well structured clay subsoil grading to soft kaolinised weathering metamorphosed siltstone*

Landform: Slopes of rolling low hills of the southern Fleurieu Peninsula

Substrate: Metamorphosed siltstones of the Backstairs Passage Formation, deeply weathered and kaolinised in this variation of the soil

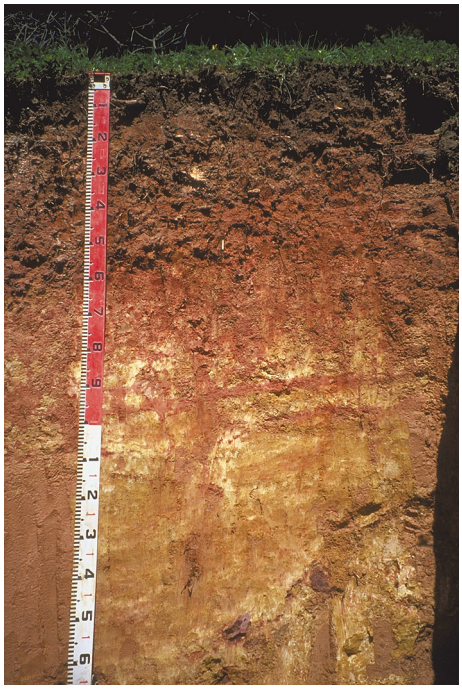
Vegetation: Eucalyptus obliqua forest

Type Site:

Site No.:	CH020	1:50,000 mapsheet:	6526-1 (Torrens Vale)
Hundred:	Yankalilla	Easting:	255950
Section:	227	Northing:	6063450
Sampling date:	31/07/92	Annual Rainfall:	860 mm average

Upper slope of rolling low hills. Firm surface, no stone. Site on edge of plantation of Pinus radiata.

Soil Description:



Depth (cm)	*Description*
0-10	Dark reddish brown weakly granular loam with 10% ironstone gravel. Clear to:
10-20	Reddish yellow massive clay loam with 10% ironstone gravel. Clear to:
20-50	Yellowish red medium heavy clay with strong polyhedral structure and 10% ironstone gravel. Gradual to:
50-70	Yellowish red medium heavy clay with strong polyhedral structure and 20% fragments of micaceous siltstone, both soft and hardened by iron oxides. Gradual to:
70-100	Brownish yellow light clay with very fine structure and more than 50% soft and iron rich micaceous siltstone fragments. Gradual to:
100-200	Soft weathering kaolinised micaceous siltstone.

Classification: Haplic, Mesotrophic, Red Chromosol; medium, slightly gravelly, loamy / clayey, deep

Summary of Properties

Drainage: Well drained. Soil is unlikely to remain wet for more than a few days.

Fertility: Natural fertility is moderate as indicated by the exchangeable cation data. The deep weathering and resultant predominance of kaolinite minerals reduces this soil's capacity to store and release plant nutrient elements. The very high organic carbon content of the surface indicates low biological activity. Test data indicate marginal deficiencies of calcium, magnesium and potassium. Manganese values are very low.

pH: Acidic at the surface, strongly acidic at base. Acidity further weakens the cation exchange complex. Dolomitic lime is needed to correct the problem and to maintain satisfactory calcium / magnesium ratios.

Rooting depth: 100 cm at type site, but there are few roots below 70 cm.

Barriers to root growth:

Physical: None.

Chemical: Moderately low subsoil fertility, made worse by low pH. Aluminium toxicity is probable because of the kaolinite-rich clay.

Waterholding capacity: 120 mm, most of which is available for plant uptake.

Seedling emergence: Good, provided high organic matter levels are maintained.

Workability: Good.

Erosion Potential:

Water: Moderately high, due to the 16% slope.

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	Ext Al mg/kg
											Cu	Fe	Mn	Zn		Ca	Mg	Na	K		
Paddock	5.3	4.9	0	0.16	-	6.7	39	160	-	0.9	1.8	155	2.8	11.9	11.5	5.8	1.5	0.25	0.25	2.2	6
											*2.3	*198	*4.3	*9.4							
0-10	5.2	4.6	0	0.10	0.32	8.4	24	170	-	1.1	2.2	193	13.5	3.5	13.8	7.3	2.1	0.33	0.31	2.4	6
10-20	5.5	4.8	0	0.05	0.15	1.8	4	62	-	0.8	0.2	42	0.3	0.3	7.8	2.8	1.7	0.27	0.12	3.5	2
20-50	5.5	4.9	0	0.07	0.18	1.0	<2	32	-	1.2	0.1	10	<0.1	0.2	8.6	2.3	3.7	0.40	0.09	4.7	<1
50-70	5.0	4.6	0	0.06	0.18	0.4	<2	<5	-	1.3	<0.1	4	<0.1	<0.1	5.6	0.7	2.6	0.28	0.05	5.0	1
70-100	4.9	4.5	0	0.05	0.16	0.2	<2	14	-	0.9	<0.1	2	<0.1	<0.1	4.0	0.4	1.8	0.17	<0.05	4.3	4
100-200	4.5	4.3	0	0.05	0.21	0.1	<2	<5	-	0.7	<0.1	2	<0.1	0.2	1.8	<0.4	0.8	0.10	<0.05	na	11

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