ACIDIC LOAM OVER BROWN AND RED CLAY ON ROCK

General Description: *Sandy loam to clay loam overlying a brown, red and yellowish mottled well structured clay, forming in weathering siltstone or fine sandstone*

Landform: Slopes of undulating to rolling low hills in the Mt. Lofty Ranges

Substrate: Weathering siltstone or fine sandstone, sometimes weakly metamorphosed

Vegetation: Open forest of blue gum and stringybark

Type Site:

Site No.:	CH048	1:50,000 mapsheet:	6628-2 (Onkaparinga)
Hundred:	Onkaparinga	Easting:	299600
Section:	93	Northing:	6130900
Sampling date:	18/03/93	Annual rainfall:	945 mm average

Upper slope of a low hill; gradient 16%; aspect 40°.
Hard setting surface with 2-10% surface siltstone fragments. Apple orchard.

Soil Description:

Depth (cm)	*Description*
0-8	Dark brown clay loam with moderate granular structure and 10-20% siltstone gravel. Clear to:
8-14	Light brown massive clay loam with 2-10% siltstone gravel. Abrupt to:
14-30	Yellowish brown and red heavy clay with strong polyhedral structure. Gradual to:
30-50	Brown, red and yellow mottled medium clay with strong polyhedral structure and 2-10% siltstone fragments. Diffuse to:
50-75	Greyish brown, red and yellowish brown medium clay with polyhedral structure and 2-10% siltstone fragments. Gradual to:
75-100	As above with 20 - 50% siltstone fragments. Clear to:
100-125	Bluish grey, yellow and red mottled medium clay (highly weathered shale).

Classification: Bleached-Mottled, Eutrophic, Brown Kurosol; medium, gravelly, clay loamy / clayey, deep

Summary of Properties

Drainage: The soil is moderately well drained, although the clay subsoil tends to restrict water movement to some extent. The profile may remain wet for a week or so.

Fertility: The soil has a moderate level of natural fertility, as indicated by the exchangeable cation values. There are no apparent deficiencies; surface organic matter levels are high.

pH: Acidic throughout, strongly so at base. Lime is needed for pH correction.

Rooting depth: 125 cm in pit, but there are few roots below 50 cm.

Barriers to root growth:

Physical: The firm clay subsoil may retard root development to some degree.

Chemical: Acidity and associated aluminium toxicity are the only apparent chemical barriers to root growth.

Waterholding capacity: 170 mm in rootzone, but about 60 mm is effectively unavailable due to low root density.

Seedling emergence: Good to fair. Surface soil will seal over and set hard if excessively disturbed.

Workability: Good to fair. Organic matter levels must be maintained.

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-S 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		
0-8	5.5	5.0	0	0.06	0.24	3.7	27	290	-	1.0	17.3	240	8.5	4.2	14.5	6.84	3.35	0.14	0.55	1.0	3.7
8-14	5.2	4.5	0	0.04	0.11	1.0	10	180	-	0.7	1.2	69	0.3	0.5	9.6	2.34	2.00	0.12	0.25	1.3	-
14-30	5.0	4.4	0	0.04	0.10	0.6	8	230	-	1.6	0.4	15	0.1	0.3	14.4	4.36	6.50	0.21	0.56	1.5	-
30-50	5.0	4.3	0	0.05	0.11	0.4	6	200	-	1.7	0.1	8	<0.1	0.1	17.9	2.70	8.35	0.28	0.50	1.6	9.9
50-75	4.9	4.3	0	0.05	0.11	0.2	5	130	-	1.2	0.1	6	<0.1	<0.1	18.2	1.07	9.95	0.29	0.21	1.6	-
75-100	4.9	4.2	0	0.05	0.13	0.2	5	94	-	0.7	0.3	11	<0.1	0.1	11.1	0.49	5.49	0.19	0.05	1.7	15.3
100-125	4.7	4.1	0	0.08	0.17	0.2	5	86	-	0.6	0.1	9	<0.1	0.1	20.0	0.38	11.83	0.36	0.12	1.8	-

Note: 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