SANDY LOAM OVER BROWN CLAY ON ROCK

General Description: *Sandy to loamy surface soil, with variable gravel, sharply overlying a yellow brown mottled, very firm clayey subsoil, grading to weathering metamorphosed sandstone*

Landform: Slopes of undulating to rolling low hills in the eastern Mount Lofty Ranges

Substrate: Micaceous sandstones of Proterozoic age

Vegetation: Open forest of blue gum and stringybark

Type Site:

Site No.:	CH039	1:50,000 mapsheet:	6628-2 (Onkaparinga)
Hundred:	Onkaparinga	Easting:	307900
Section:	414	Northing:	6131750
Sampling date:	18/12/92	Annual rainfall:	820 mm average

Upper slope of rolling rises, slope 15%. Up to 10% surface ironstone. Pasture.

Soil Description:

Depth (cm)	Description
0-15	Dark greyish brown light sandy clay loam with 10-20% sandstone gravel. Abrupt to:
15-25	Pale brown massive sandy clay loam with abundant ironstone and sandstone gravel. Abrupt to:
25-40	Pale brown, orange and red mottled medium clay with strong prismatic structure. Gradual to:
40-80	Yellowish brown, light grey and red mottled medium clay with strong coarse angular blocky structure. Diffuse to:
80-130	Brownish yellow, white and red silty clay loam (highly weathered and kaolinised fine micaceous sandstone).

Classification: Bleached-Ferric, Eutrophic, Grey Kurosol; medium, gravelly, loamy / clayey, deep

Summary of Properties

Drainage: Moderately well to imperfectly drained, due to the tight, dispersive clay subsoil. The soil may remain wet for a week to several weeks.

Fertility: Natural fertility is moderate. Exchangeable calcium and magnesium are deficient, with surface magnesium levels sufficiently low to cause hypomagnesia. Copper is also low. Phosphate fixation is likely due to high iron content, although surface phosphorus is satisfactory. Organic carbon levels should be maintained at 2% for optimal nutrient retention. Further acidification will weaken the soil's capacity to store nutrients.

pH: Acidic at the surface, strongly acidic with depth. Dolomite is needed for pH correction.

Rooting depth: 100 cm in pit, but few roots below 80 cm.

Barriers to root growth:

Physical: Waterlogging associated with low permeability clay limits winter root growth and subsequent rapid drying and hardening of 15-25 cm layer may restrict spring root development. The high strength magnesic clay may also retard root growth.

Chemical: Acidity and consequent reduced nutrient retention capacity is the main chemical limitation. Aluminium levels are only high enough to affect sensitive species.

Waterholding capacity: 120 mm in rootzone, but 20-40 mm are unavailable due to low root densities.

Seedling emergence: Fair to good. Surface may seal over after rain.

Workability: Fair, provided that organic matter levels are maintained. Otherwise shattering or puddling will occur if soil is worked too dry or too wet respectively.

Erosion Potential:

Water: Moderately high to high, due to the 15% slope and high soil erodibility.

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 (EDTA)				CEC cmol (+)/kg	Exchangeable Cations cmol(+)/kg				ESP	Ext Al mg/kg
											Cu	Fe	Mn	Zn		Ca	Mg	Na	K		
Paddock	5.2	4.6	0	0.08	0.52	2.0	42	200	-	0.6	0.97	288	44.0	12.1	6.3	3.21	0.75	0.15	0.47	2.4	4
0-15	5.0	4.3	0	0.07	0.39	2.4	35	240	-	0.7	-	-	-	-	6.8	3.09	0.64	0.13	0.51	1.9	4
15-25	5.1	4.5	0	0.05	0.20	0.58	7	110	-	0.5	-	-	-	-	4.5	1.67	0.62	0.12	0.15	2.7	1
25-40	5.0	4.4	0	0.09	0.23	0.79	<2	78	-	1.4	-	-	-	-	12.4	4.55	5.05	0.28	0.19	2.3	<1
40-80	4.9	4.3	0	0.06	0.15	0.47	<2	78	-	1.1	-	-	-	-	8.4	2.24	4.18	0.15	0.12	1.8	<1
80-130	4.9	4.3	0	0.04	0.08	0.19	<2	31	-	0.9	-	-	-	-	5.4	0.68	3.23	0.23	0.10	4.3	2

Note: Paddock sample bulked from 20 cores (0-10 cm) taken around the pit.
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