SANDY LOAM OVER RED DISPERSIVE CLAY ON ROCK

General Description: *Red brown sandy to loamy surface soil overlying a red dispersive clayey subsoil, calcareous at depth*

Landform: Slopes of undulating to rolling rises and low hills of the eastern Mt. Lofty Ranges

Substrate: Highly micaceous schists of the Kanmantoo Group

Vegetation: Blue gum/sheoak woodland

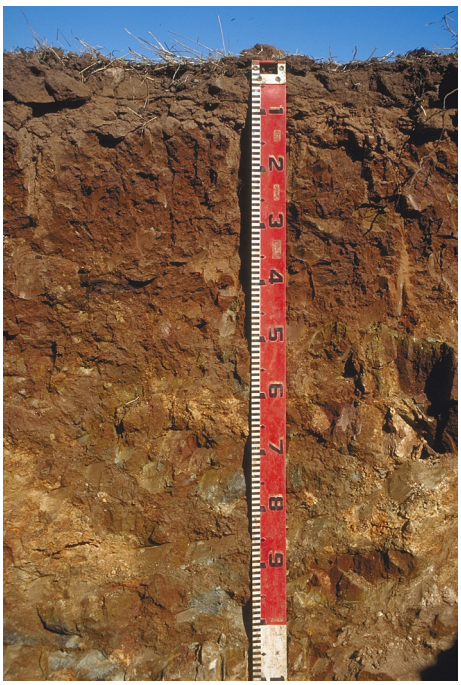
Type Site:

Site No.:	CH060	1:50,000 mapsheet:	6728-3 (Tepko)
Hundred:	Monarto	Easting:	322200
Section:	99	Northing:	6128950
Sampling date:	19/01/94	Annual rainfall:	650 mm average

Lower slope of a low rise at the top of the Bremer Escarpment. Hard setting surface, 5% slope. Saline seepage in watercourse further down the slope.

Soil Description:

Depth (cm)	*Description*
0-5	Dark reddish brown massive hard sandy loam with 2-10% quartz gravel. Abrupt to:
5-12	Reddish brown (bleached dry) massive hard loamy sand with 2-10% quartz gravel. Abrupt to:
12-35	Red hard medium clay with strong coarse columnar structure and 10-20% schist and sandstone gravel. Clear to:
35-60	Red light clay with blocky structure, minor soft segregations and more than 50% schist and sandstone fragments. Clear to:
60-100	Red and dark brown mottled calcareous light clay with moderate blocky structure and 2-10% soft carbonate. Clear to:
100-130	Weathering schist with minor soft carbonate segregations.



Classification: Calcic, Subnatric, Red Sodosol; medium, slightly gravelly, loamy / clayey, deep

Summary of Properties

Drainage: The soil in moderately well to imperfectly drained. Waterlogging may be a problem in some years.

Fertility: The subsoil clay has a high capacity to store and supply nutrients, but the low clay content surface does not. Magnesium, calcium, copper, zinc and manganese are all marginally deficient. Organic carbon levels are high.

pH: Acidic at the surface, strongly alkaline with depth. Application of lime is needed to correct pH.

Rooting depth: 60 cm in pit, but very few roots below 35 cm.

Barriers to root growth:

Physical: Poor soil structure prevents even root distribution.

Chemical: Very high subsoil pH inhibits nutrient uptake and is probably the main limitation to satisfactory subsoil root growth.

Waterholding capacity: Approx. 120 mm in profile, but at least half is unavailable due to poor root distribution. Poor water use contributes to down-slope salinization.

Seedling emergence: Fair due to hard setting surface. This is caused by high fine sand content and high exchangeable sodium (ESP).

Workability: Fair due to poor surface structure. Soil changes quickly from being too wet to too dry, limiting time for effective cultivation.

Erosion Potential:

Water: Moderate, due to high surface erodibility and slope.

Wind: Moderately 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	5.9	4.8	0	0.08	0.49	1.9	19	280	-	1.1	0.6	168	5.7	0.5	7.4	4.17	1.27	0.57	0.58	7.3
											*0.8	*197	*10	*0.9						
0-5	5.8	4.7	0	0.09	0.64	2.6	28	284	-	0.9	0.8	239	5.2	1.2	7.9	4.31	1.22	0.58	0.71	7.7
5-12	5.9	4.8	0	0.06	0.37	1.6	18	194	-	0.7	0.5	197	2.5	0.9	7.4	4.17	0.97	0.55	0.35	7.4
12-35	7.8	6.7	0	0.60	1.10	0.6	<4	258	-	3.6	1.5	21	0.2	0.1	22.1	6.05	9.22	2.92	0.92	13.2
35-60	9.1	8.3	0.4	0.68	1.40	0.4	<4	283	-	5.0	1.7	16	0.4	0.2	19.3	5.58	9.93	3.73	0.93	19.2
60-100	9.7	8.6	8.3	0.63	2.65	0.2	<4	231	-	3.1	0.9	6	0.3	0.2	12.7	3.75	6.74	3.27	0.49	25.7

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