

ACIDIC LOAM OVER RED CLAY ON WEATHERED ROCK

General Description: *Hard brown loam with a paler gravelly subsurface layer overlying a well structured red, brown and yellow clay grading to weathering basement rock*

Landform: Slopes of rolling low hills, central Mt. Lofty Ranges

Substrate: Medium to fine grained sandstone

Vegetation: Eucalyptus obliqua / E. leucoxylon forest



Type Site: Site No.: CH091

1:50,000 sheet:	6627-4 (Noarlunga)	Hundred:	Willunga
Annual rainfall:	700 mm	Sampling date:	29/04/96
Landform:	Upper slope of rolling low hills, 5% slope		
Surface:	Hard setting with negligible stone		

Soil Description:

Depth (cm)	Description
0-12	Dark brown loam with weak granular structure and 2-10% ironstone nodules. Gradual to:
12-28	Yellowish red hard massive clay loam with 10-20% ironstone nodules and quartz gravel. Abrupt to:
28-50	Yellowish red hard medium heavy clay with coarse prismatic breaking to strong polyhedral structure. Gradual to:
50-85	Red and brown mottled medium heavy clay with structure as above. Diffuse to:
85-125	Red and yellowish brown mottled medium heavy clay with structure as above. Diffuse to:
125-155	Red and yellowish brown mottled medium heavy clay with strong polyhedral structure, slickensides and 20-50% ironstone and quartz fragments. Diffuse to:
155-190	Red and yellowish brown mottled medium clay with 20-50% fine sandstone fragments.



Classification: Sodic, Eutrophic, Red Chromosol; medium, slightly gravelly, loamy / clayey, very deep

Summary of Properties

Drainage	Moderately well drained. Water will "perch" on top of the heavy clay subsoil, saturating the upper part of the soil for a week or so at a time.
Fertility	The predominance of the clay mineral kaolin causes this soil's natural fertility to be moderately low, as indicated by the exchangeable cation data (except the anomalous 0-12 cm sample). Test data indicate possible manganese deficiency.
pH	Acidic at the surface, grading to neutral, but strongly acidic with depth. Lime is needed to correct pH
Rooting depth	There are roots to 160 cm, although these are probably tree roots.
Barriers to root growth	
Physical:	The heavy clay subsoil restricts optimum root proliferation, preventing uniform distribution of roots.
Chemical:	Potentially toxic levels of salt and sodicity from 125 cm, acidity from 155 cm.
Water holding capacity	Over 150 mm in potential rootzone (very high).
Seedling emergence:	Fair to good. Adequate levels of organic matter are needed to prevent surface sealing.
Workability:	Good to fair - unless organic matter levels are maintained, there is only a limited moisture range for effective working.
Erosion Potential	
Water:	Moderate, due to the slope of the land.
Wind:	Low.

Laboratory Data

Depth cm	pH H ₂ O	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 (EDTA)				CEC cmol (+)/kg	Exchangeable Cations cmol(+)/kg				ESP
											Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
Row	5.8	5.6	0	0.38	3.17	2.4	25	300	24	1.2	4.52	189	13.9	12.8	12.0	7.67	2.73	0.37	0.58	3.1
0-12	5.4	5.1	0	0.42	2.34	10.0?	262?	904	30	2.7	-	-	-	-	26.5	17.63	5.10	0.23	2.01	0.9
12-28	6.8	6.2	0	0.08	0.67	0.7	32	428	8	1.3	-	-	-	-	7.3	4.32	2.28	0.19	0.82	2.6
28-50	7.0	6.5	0	0.13	0.50	1.1	5	811	17	1.5	-	-	-	-	14.8	5.99	6.60	0.44	2.05	3.0
50-85	6.5	6.3	0	0.24	0.89	0.4	<4	415	128	1.9	-	-	-	-	12.0	4.25	6.68	1.11	0.89	9.3
85-125	6.4	6.0	0	0.27	1.04	0.3	<4	168	133	1.4	-	-	-	-	10.9	3.25	5.85	1.82	0.31	16.7
125-155	6.1	5.9	0	0.76	4.61	0.3	<4	131	113	1.3	-	-	-	-	9.2	2.89	5.25	2.04	0.28	22.2
155-190	4.8	4.8	0	1.76	9.40	0.2	<4	76	80	1.1	-	-	-	-	6.6	1.59	4.57	1.53	0.12	23.2

Note: Row sample bulked from 20 cores (0-10 cm) taken along the planting rows.

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.