

LOAM OVER RED CLAY

General Description: *Hard setting red brown loam to clay loam overlying a well structured reddish clay subsoil, calcareous with depth, grading to fine grained alluvium*

Landform: Gently sloping outwash fans, and level flats and plains

Substrate: Fine grained, although often gravelly, alluvium (Pooraka Formation)

Vegetation: Blue gum - red gum woodland



Type Site: Site No.: CH067

1:50,000 sheet: 6627-3 (Willunga) Hundred: Willunga
 Annual rainfall: 600 mm Sampling date: 26/05/94
 Landform: Midslope of a very gently sloping alluvial fan, 2.5% slope
 Surface: Hard setting with no stones

Soil Description:

Depth (cm)	Description
0-16	Dark brown weakly structured silty loam. Clear to:
16-27	Reddish brown massive silty clay loam. Abrupt to:
27-36	Reddish brown light medium clay with moderate fine polyhedral structure. Clear to:
36-50	Red medium clay with strong polyhedral structure. Clear to:
50-65	Reddish brown medium clay with strong polyhedral structure and 20-50% gravel. Clear to:
65-100	Brown and yellow mottled heavy clay with very coarse prismatic structure. Abrupt to:
100-150	Brown and reddish mottled coarsely structured heavy clay with 10-20% soft carbonate. Diffuse to:
150-200	Yellowish and reddish mottled coarsely structured heavy clay with 10-20% soft carbonate.



Classification: Bleached-Sodic, Eutrophic, Red Dermosol; medium, non-gravelly, loamy/clayey, moderate

Summary of Properties

Drainage Moderately well drained. The soil is unlikely to remain wet for more than a week. The heavy clay from 65 cm has a very uneven surface (varies from 65 cm to 100 cm below the ground surface, the hollows of which will pond water, as observed in the pit when sampling. Waterlogging is unlikely to be a problem unless irrigation is excessive.

Fertility The inherent fertility level of the soil is moderate, as indicated by the exchangeable cation data. However some losses of calcium, magnesium and potassium have occurred as a result of acidification. Calcium and phosphorus values are low by agricultural standards. Organic carbon, and therefore nitrogen reserves are also low (could be 50% higher). Potassium, magnesium and trace elements are adequate.

pH Neutral at the surface, acidic to 65 cm and then alkaline.

Rooting depth Pit not between tree rows, but few roots would be expected below 85 cm.

Barriers to root growth

Physical: The tough clay below the soil (from 65 cm) will restrict root growth.

Chemical: The only apparent barrier is salt, accumulating from irrigation water applications. This is indicated by the three fold increase in salinity in the tree line compared with outside the orchard. Levels should be monitored to check that they do not exceed 0.2 dS/m at the surface and 0.3 dS/m in the subsoil (measured on 1:5 soil:water). Boron levels, being less than 10 mg/kg, are unlikely to be toxic.

Water holding capacity Approximately 120 mm in upper 100 cm. Readily available water capacity in the potential root zone (i.e. 85 cm) for irrigated crops is about 55 mm.

Workability Fair due to the hard setting, low organic matter surface.

Erosion Potential Low.

Laboratory Chemical Data

Depth cm	pH H ₂ O	pH CaCl ₂	CaCO ₃ %	EC1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K 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	
Row	7.8	7.5	0	0.20	1.55	1.3	22	208	2.0	4.8	14	17.6	7.5	8.4	5.1	2.2	0.58	0.42	6.9
										*11.6	*90	*192	*10.3						
0-16	5.9	5.4	0	0.07	0.53	1.2	31	308	0.9	4.4	31	19.7	2.2	6.9	5.1	0.7	0.21	0.71	3.0
16-27	5.1	4.7	0	0.10	0.69	0.6	5	166	0.7	0.8	11	3.2	3.2	8.0	4.3	1.9	0.27	0.39	3.4
27-36	5.0	4.7	0	0.14	0.72	0.5	4	171	1.0	1.3	9	1.3	0.2	10.2	4.8	3.5	0.41	0.43	4.0
36-50	5.3	5.0	0	0.14	0.73	0.3	4	172	1.1	1.1	7	2.7	0.2	11.3	4.6	4.5	0.46	0.49	4.1
50-65	5.7	5.4	0	0.16	0.86	0.4	4	191	1.2	1.1	8	4.3	0.3	11.8	5.1	4.9	0.54	0.52	4.6
65-100	7.1	6.5	0	0.12	0.62	0.3	<4	338	3.7	1.2	9	4.5	0.2	24.7	10.9	10.3	1.44	1.17	5.8
100-150	8.6	8.0	12.8	0.23	0.85	0.2	<4	304	4.5	0.6	9	1.0	0.2	26.1	12.4	11.3	1.62	1.11	6.2
150-200	8.6	8.0	11.1	0.26	1.00	0.1	<4	305	5.2	0.7	10	1.1	0.2	26.8	12.2	11.7	1.84	1.13	6.9

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

* EDTA trace element analyses for "row" 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.