CLAY LOAM OVER BROWN CLAY

General Description: *Greyish medium textured surface soil with a bleached A2 horizon, overlying a brown mottled clayey subsoil with minor carbonate at depth, formed in fine grained alluvium*

Landform: Out wash fans, lower slopes and alluvial flats

Substrate: Fine grained, sometimes gravelly alluvium

Vegetation: Red gum - blue gum woodland

Type Site: Site No.: CH069

1:50,000 sheet:	6627-3 (Willunga)	Hundred:	Willunga
Annual rainfall:	625 mm	Sampling date:	26/05/94
Landform:	Midslope of a gently sloping alluvial fan, 3% slope		
Surface:	Hard setting with minor slate gravel		

Soil Description:

Depth (cm)	*Description*
0-10	Dark greyish brown fine sandy clay loam. Clear to:
10-28	Dark greyish brown fine sandy clay loam with 20-50% slate gravel. Clear to:
28-45	Bleached clay loam with rusty mottles. Clear to:
45-80	Brown, yellowish and red mottled medium heavy clay with very coarse prismatic structure and slickensides. Gradual to:
80-105	Yellowish red and brown mottled weakly structured medium clay and 2-10% slate gravel. Clear to:
105-130	Dark brown and reddish mottled heavy clay with very coarse prismatic structure. Gradual to:
130-180	Brown and reddish mottled slightly calcareous weakly structured heavy clay.

Classification: Bleached-Vertic, Eutrophic, Brown Chromosol; thick, non-gravelly, clay loamy/clayey, deep

Summary of Properties

Drainage Imperfectly drained. The tight clay subsoil has low permeability resulting in the "perching" of water in the bleached layer. This problem will be worse where the clay is at shallow depth. Avoidance of over watering is especially critical on this soil.

Fertility The soil has a moderate level of inherent fertility, as indicated by the CEC values, although the bleached subsurface layer has a very low nutrient storage capacity (CEC less than 5 cmol). Surface soil fertility depends on organic matter content which is adequate (organic carbon more than 2%). By agricultural standards, the other elements (with the exception of magnesium) are well supplied.

pH Acidic at the surface (neutral pH in immediate topsoil due to either lime application or road dust), grading to alkaline with depth.

Rooting depth The pit is outside of the planted area, but expected root zone depth is 105 cm. Densities would be low below 45 cm. Most growth is likely in the upper 30 cm.

Barriers to root growth

Physical: The tight clay subsoil is the main physical barrier, along with potential waterlogging.

Chemical: The only unfavourable chemical condition in the soil is salt accumulation from saline irrigation water. This is probably concentrated at the surface, where it is around double the desirable level of 0.25 d/m (1:5 soil:water). The boron and sodicity levels are within acceptable limits. There is possible manganese and iron imbalance resulting from waterlogging.

Water holding capacity Approximately 160 mm, but not all is effectively available due to the anticipated low density of roots in the subsoil. Readily available water capacity in the potential root zone of irrigated crops (i.e. 105 cm) is about 65 mm.

Workability Fair. The surface has a tendency to set down and become boggy when wet.

Erosion Potential Low.

Laboratory Chemical Data

Depth cm	pH H_2O	pH $CaC1_2$	CO_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	7.0	6.9	0	0.60	4.01	2.1	97	403	1.5	10.9	43	10.7	6.1	11.6	13.0	1.3	0.39	1.05	2.5
0-10	6.3	6.1	0	0.20	1.45	2.0	29	390	1.0	2.6	47	14.1	4.3	11.3	8.4	1.0	0.25	0.90	2.2
10-28	5.4	4.9	0	0.07	0.63	1.1	6	285	0.6	0.6	91	9.4	0.5	8.9	6.1	1.3	0.23	0.51	2.6
28-45	5.0	4.4	0	0.04	0.34	0.2	<4	177	0.3	0.4	26	4.9	0.2	4.4	3.2	1.2	0.16	0.24	3.6
45-80	6.1	5.6	0	0.15	0.73	0.3	<4	236	1.7	1.1	13	7.0	0.2	18.8	8.7	7.2	0.78	0.75	4.1
80-105	6.8	6.3	0	0.12	0.69	0.2	<4	175	1.3	0.6	7	5.5	0.2	10.2	5.8	4.2	0.54	0.46	5.3
105-130	7.5	7.0	0.1	0.18	0.93	0.2	<4	243	3.4	0.7	7	2.4	0.1	23.2	12.0	6.6	0.97	0.73	4.2
130-180	8.2	7.9	0.3	0.24	1.43	0.1	<4	196	2.1	0.6	8	2.1	0.2	16.1	9.4	5.4	0.65	0.49	4.0

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

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.