LOAM OVER RED CLAY

General Description: *Hard loamy surface soil overlying a well structured red clay with abundant soft carbonate at depth*

Landform: Slopes of undulating rises

Substrate: Quaternary alluvial clay mantled by soft carbonate.

Vegetation:

Type Site: Site No.: CH096

1:50,000 sheet:	6627-3 (Willunga)	Hundred:	Willunga
Annual rainfall:	525 mm	Sampling date:	29/04/96
Landform:	Midslope of an undulating rise, 4% slope		
Surface:	Hard setting with no stone		

Soil Description:

Depth (cm)	*Description*
0-10	Grey brown massive hard fine sandy loam. Abrupt to:
10-30	Dark reddish brown medium heavy clay with coarse prismatic structure breaking to strong polyhedral. Gradual to:
30-50	Dark reddish brown medium heavy clay with coarse prismatic structure. Abrupt to:
50-90	Reddish yellow and brown very highly calcareous medium clay with weak polyhedral structure and more than 50% soft carbonate segregations. Diffuse to:
90-180	Reddish yellow very highly calcareous medium clay with weak polyhedral structure and more than 50% soft carbonate segregations.

Classification: Sodic, Hypercalcic, Red Chromosol; medium, non-gravelly, loamy / clayey, very deep

Summary of Properties

Drainage Well drained. The soil is unlikely to remain saturated for more than a day or so following prolonged rainfall or irrigation.

Fertility Natural fertility is high as indicated by the exchangeable cation data for the subsoil, but the nutrient retention capacity of the lower clay content surface soil relies on adequate organic carbon levels (about 1.5%). Levels of measured nutrients are adequate.

pH Neutral at the surface, alkaline with depth.

Rooting depth Few roots below 90 cm in pit.

Barriers to root growth

Physical: The coarsely structured clay prevents uniform root distribution (most roots grow between the structural aggregates instead of through them).

Chemical: There are no toxicity problems associated with boron, sodicity or salinity, but note that the electrical conductivity and sulphate levels of the surface soil along the rows is moderately high due to either irrigation water salt or gypsum.

Water holding capacity Approximately 110 mm in root zone (high), although not all of this is readily available due to poor root distribution in the subsoil.

Seedling emergence: Fair to good depending on the friability of the surface which will seal if organic matter levels are too low. Gypsum will help to overcome poor surface structure.

Workability: Fair to good, as above, depending on organic matter and gypsum applications.

Erosion Potential

Water: Moderate, due to the slope and erodibility of the soil.

Wind: Low.

Laboratory 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	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	6.2	6.0	0	0.70	5.34	1.4	64	398	148	1.3	9.90	99	137	14.0	10.2	8.34	1.90	0.46	1.07	4.5
											*6.6	*36	*33	*9.9						
0-10	7.7	7.1	0	0.10	0.71	1.6	20	385	6	0.8	-	-	-	-	10.5	8.34	1.14	0.26	0.92	2.5
10-30	7.3	6.7	0.1	0.10	0.32	1.1	7	492	3	1.7	-	-	-	-	35.0	24.5	4.25	0.81	1.89	2.3
30-50	7.5	6.8	0.1	0.10	0.25	0.9	4	432	3	2.0	-	-	-	-	47.2	34.5	6.07	1.48	2.08	3.1
50-90	8.6	7.8	53.0	0.21	0.74	0.1	4	214	50	0.8	-	-	-	-	17.7	14.9	3.97	0.84	0.64	4.7
90-180	8.9	8.0	52.7	0.23	0.91	0.1	<4	231	13	0.6	-	-	-	-	19.2	11.3	8.38	1.18	0.63	6.1

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

* DTPA 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.