SANDY LOAM OVER POORLY STRUCTURED BROWN CLAY

General Description: *Loamy sand to sandy clay loam surface soil sharply overlying yellow, brown and red mottled clay.*

Landform: Slopes of rolling low hills

Substrate: Weakly consolidated clayey sand to sandy clay sediments deposited in ancient glacial valleys

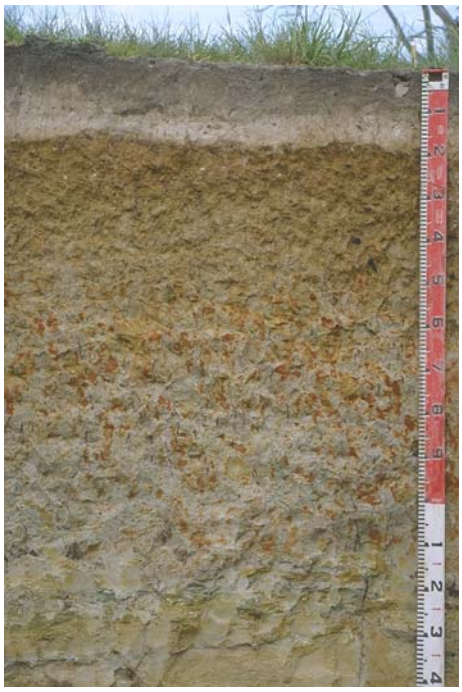
Vegetation: Eucalyptus fasciculosa / Euc. leucoxylon woodland

Type Site: Site No.: CH025

1:50,000 sheet:	6627-3 (Willunga)	Hundred:	Encounter Bay
Annual rainfall:	700 mm	Sampling date:	14/10/92
Landform:	Upper slope of 10% in a landscape of undulating low hills		
Surface:	Hard setting surface with occasional granite boulders (glacial erratics)		

Soil Description:

Depth (cm)	*Description*
0-10	Dark greyish brown massive sandy loam with trace of quartz gravel. Abrupt to:
10-18	Very pale brown massive loamy sand with 10% quartz gravel. Abrupt to:
18-39	Dark yellowish brown and brown heavy clay with strong coarse prismatic structure. Gradual to:
39-60	Yellowish brown and red medium heavy clay with coarse prismatic structure. Gradual to:
60-110	Light grey, olive brown and red sandy clay with weak prismatic structure. Diffuse to:
110-160	Light grey and yellow massive clayey sand to sandy clay, hardened in places to sandstone.



Classification: Bleached-Mottled, Eutrophic, Brown Kurosol; medium, non-gravelly, loamy / clayey, deep

Summary of Properties

Drainage Imperfectly drained because water "perches" on top of the slowly permeable subsoil clay. The soil may remain wet for several weeks.

Fertility Natural fertility is moderate as indicated by the exchangeable cation data. The subsoil clay has a high capacity for storing nutrients. Copper, manganese and zinc are all very low below the top 10 cm. Phosphorus is adequate but potassium is marginal at 90 mg/kg. Each of the major cations (calcium, magnesium and potassium) are deficient. Other elements are satisfactory.

pH Acidic throughout. Applications of dolomitic lime are required.

Rooting depth 110 cm at type site, but root density is very low from 60 cm.

Barriers to root growth

Physical: The massive, hard 10-18 cm layer, and the tight subsoil clay both restrict the proliferation of roots. Root growth is also restricted by waterlogging in subsurface layers. These layers commonly dry very rapidly in spring, creating a barrier between the root mass in the surface soil and the stored water in the subsoil.

Chemical: Low pH and low subsoil fertility may both play a role in restricting root growth.

Water holding capacity 70 mm in upper 60 cm, and a further 60 mm below, most of which is effectively unavailable because of poor root growth.

Seedling emergence Fair due to the poorly structured hard setting surface.

Workability Fair. The soil has a narrow moisture range for effective working.

Erosion Potential

Water: Moderately high because of the very high erodibility of the soil and the 10% slope.

Wind: Low.

Laboratory Data

Depth cm	pH H_2O	pH $CaCl_2$	$CaCO_3$ %	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 (DTPA)				CEC cmol (+)/kg	Exchangeable Cations cmol(+)/kg				ESP	Ext Al mg/kg
											Cu	Fe	Mn	Zn		Ca	Mg	Na	K		
0-10	5.2	4.6	0	0.05	0.27	2.6	39	90	-	1.2	0.3	374	4.0	1.8	4.8	2.91	0.71	0.12	0.18	2.5	3
10-18	5.3	4.7	0	0.04	0.12	0.3	14	55	-	0.7	<0.1	170	0.1	0.2	1.2	0.64	0.24	0.13	0.10	na	2
18-39	5.3	4.5	0	0.06	0.14	0.8	<4	209	-	2.4	0.1	69	0.2	0.1	18.9	5.16	8.73	0.49	0.59	2.6	2
39-60	5.5	4.5	0	0.07	0.21	0.2	<4	136	-	1.3	<0.1	15	<0.1	0.1	13.2	2.41	7.36	0.56	0.31	4.2	<1
60-110	5.5	4.4	0	0.06	0.27	0.1	<4	88	-	1.6	<0.1	6	<0.1	0.2	9.1	1.34	5.35	0.51	0.21	5.6	2
110-160	5.5	4.2	0	0.04	0.33	<0.1	<4	58	-	1.0	<0.1	17	<0.1	0.1	4.1	0.79	2.70	0.40	0.09	9.8	2

Note: 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.