

SANDY CLAY LOAM OVER DARK CLAY

General Description: *Black medium to fine textured well structured surface soil, overlying a dark, mottled clayey subsoil, calcareous with depth and formed on heavy clay deposits*

Landform: Flat to very gently undulating (often gilgaied) elevated plains

Substrate: Coarsely structured heavy clay sediments (Hindmarsh Clay)

Vegetation:



Type Site: Site No.: CH070

1:50,000 sheet: 6527-2 (Yankalilla) Hundred: Willunga
 Annual rainfall: 500 mm Sampling date: 26/05/94
 Landform: Very gently undulating plain, 1% slope
 Surface: Firm with no stones

Soil Description:

Depth (cm)	Description
0-12	Black moderately calcareous well structured light clay. Clear to:
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Old soil surface	
12-28	Very dark grey moderately calcareous weakly structured fine sandy clay loam. Clear to:
28-50	Bleached massive sandy clay loam. Sharp to:
50-90	Dark greyish brown, brown and yellowish brown mottled medium clay with very coarse columnar structure. Abrupt to:
90-140	Brown highly calcareous heavy clay with very coarse prismatic structure and 10-20% soft carbonate segregations. Diffuse to:
140-200	Greenish and brown mottled highly calcareous heavy clay with coarse structure, slickensides and 2-10% soft carbonate segregations.



Classification: Melanic, Regolithic, Hypocalcic Calcarosol; non-gravelly, clayey, very shallow - **overlying** Bleached-Vertic, Calcic, Black Chromosol; thick, non-gravelly, clay loamy/clayey, deep

Summary of Properties

Drainage	The soil is imperfectly drained. The clayey subsoil has low permeability and traps water on its surface, causing a perched water table to form. This can be avoided by avoiding heavy and prolonged water applications.
Fertility	The inherent fertility of the soil is very high, as indicated by the exchangeable cation data (CEC more than 15 and a high proportion of exchangeable calcium (Ca)). Phosphorus, potassium, calcium, magnesium and trace elements are all high by agricultural standards. Organic carbon levels are adequate, but could be higher.
pH	Alkaline at the surface becoming strongly alkaline with depth.
Rooting depth	200 cm in pit, but few below 140 cm.
Barriers to root growth	
Physical:	The tight clay below 90 cm affects root proliferation to some extent.
Chemical:	Salinity is high in the tree line (five times desirable levels), although this appears to be concentrated in the surface. Nevertheless, salt is almost certainly reducing yields. Subsoil boron is possibly also at toxic concentrations, although high alkalinity at that depth will limit root growth anyway.
Water holding capacity	Approximately 180 mm in upper 1.5 metres.
Workability	Good to fair. These heavy black soils tend to become sticky when wet.
Erosion Potential	Low

Laboratory Chemical 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	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	7.9	7.6	*1.8	1.25	7.67	1.9	55	452	2.4	7.4	11	15.4	20.2	23.5	17.4	4.0	1.48	1.56	4.0
0-12	8.0	7.7	*1.4	0.19	0.99	2.6	66	788	2.4	9.9	25	8.1	18.9	25.7	20.7	2.8	0.16	2.47	0.6
12-28	8.3	7.9	*0.6	0.10	0.36	1.1	5	307	1.4	0.7	10	7.9	0.4	16.8	14.1	1.4	0.15	0.88	0.9
28-50	8.4	7.9	0.1	0.08	0.26	0.5	6	90	0.5	0.5	8	13.1	0.3	8.4	7.5	0.7	0.15	0.22	1.8
50-90	8.5	7.8	0.1	0.09	0.29	0.4	<4	187	2.2	0.7	11	5.1	0.2	23.7	13.9	6.0	1.00	0.72	4.2
90-140	9.4	8.2	21.8	0.33	0.81	0.2	<4	266	6.6	0.5	6	1.5	0.1	26.7	9.6	11.6	4.24	1.11	15.9
140-200	10.0	8.9	8.5	0.62	1.23	0.1	<4	325	14.0	0.3	5	0.7	0.2	32.3	5.6	14.3	11.23	1.26	34.8

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

CEC (cation exchange capacity) is a measure of the soil's capacity to store and supply nutrients.

ESP (exchangeable sodium percentage) is derived by dividing the exchangeable sodium value by the CEC.

* Carbonate in surface horizons has probably been dragged in from nearby calcareous soils during cultivation of the land prior to the establishment of the orchard.