

LOAM OVER COARSELY STRUCTURED BROWN CLAY

General Description: *Hard gravelly silty loam with a bleached A2 layer, abruptly overlying a coarsely prismatic brown mottled clay, calcareous with depth*

Landform: Gently sloping alluvial fans.

Substrate: Clayey outwash sediments with gravel seams.

Vegetation: Eucalyptus woodland.



Type Site: Site No.: CH145

1:50,000 sheet: 6627-4 (Noarlunga) Hundred: Willunga
 Annual rainfall: 650 mm Sampling date: 17/01/05
 Landform: Midslope of a gently inclined alluvial fan, 4% slope
 Surface: Hard setting with 2-10% surface quartzite and ironstone gravels to 20 mm

Soil Description:

Depth (cm)	Description
0-18	Dark brown firm massive silty loam with 2-10% quartzite and ironstone gravel to 20 mm. Clear to:
18-32	Very pale brown with brown mottles hard massive silty loam with 20-50% quartzite and ironstone gravel to 20 mm. Abrupt to:
32-55	Dark yellowish brown, yellowish brown and red mottled very hard heavy clay with moderate very coarse prismatic structure, breaking to fine angular blocky. Gradual to:
55-80	Olive brown and light olive brown mottled very hard heavy clay with moderate very coarse prismatic structure, breaking to coarse lenticular. Gradual to:
80-125	Light olive brown and reddish yellow firm highly calcareous heavy clay with moderate very coarse prismatic breaking to coarse lenticular structure, and 10-20% fine carbonate. Diffuse to:
125-155	Brown, red and brownish yellow mottled firm medium heavy clay with strong coarse prismatic, breaking to angular blocky structure and 10-20% fine carbonate.



Classification: Calcic, Mottled-Subnatric, Brown Sodosol; thick, slightly gravelly, silty / clayey, deep

Summary of Properties

Drainage: Moderately well drained. Water perches on top of the clayey subsoil for up to a week following heavy or prolonged rainfall.

Fertility: Inherent fertility is moderately low, as indicated by the exchangeable cation data. Most surface nutrient retention capacity is attributable to organic matter (the bleached subsurface layer with little organic carbon has a low sum of cations). Nevertheless, concentrations of all tested elements are satisfactory.

pH: Slightly acidic at the surface, alkaline with depth.

Rooting depth: 125 cm in sampling pit, but few roots below 80 cm.

Barriers to root growth:

Physical: The poorly structured heavy clay subsoil restricts root growth, causing confinement of most roots to the surfaces of the coarse aggregates.

Chemical: There are no apparent chemical barriers. Elevated sodicity in the upper subsoil is caused by irrigation water. Note also a slight soluble salt bulge in the underlying layer.

Water holding capacity: (Estimates for potential root zone of grape vines)

Total available: 110 mm

Readily available: 50 mm

Seedling emergence: Fair due to tendency of surface to seal and set hard.

Workability: Fair. Fine sandy and silty soils are prone to compaction, and are liable to shatter if worked too dry, or puddle if worked too wet.

Erosion Potential

Water: Moderately low, due to the slight slope. The soil is highly erodible due to instability of surface, and likelihood of becoming saturated.

Wind: Low (but powdering through excessive cultivation must be avoided).

Laboratory Data

Depth cm	pH H ₂ O	pH CaCl ₂	CO ₃ %	EC 1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	Cl mg/kg	SO ₄ -S mg/kg	Boron mg/kg	Trace Elements mg/kg (EDTA)				Sum cations cmol (+)/kg	Exchangeable Cations cmol(+)/kg				Est. ESP
												Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
0-18	6.5	5.6	0	0.079	0.55	2.08	35	278	20	11.2	0.6	2.85	423	59.4	4.16	8.2	5.97	1.25	0.38	0.61	4.6
18-32	6.5	5.4	0	0.036	0.48	0.20	3	71	8	4.7	0.3	0.59	72	35.7	0.47	2.7	1.64	0.5	0.32	0.19	na
32-55	6.3	5.5	0	0.145	0.63	0.41	2	216	48	35.9	0.9	1.42	105	5.57	0.56	26.1	16.2	7.62	1.66	0.61	6.4
55-80	7.7	7.2	0.8	0.263	1.13	0.31	2	211	68	56.5	0.7	1.14	45	42.5	0.43	32.4	21.9	8.51	1.44	0.57	4.4
80-125	8.7	7.7	20.4	0.207	0.89	0.16	2	129	66	23.2	1.0	0.51	13	3.34	0.47	26.7	18.5	6.64	1.20	0.39	4.5
125-155	8.8	7.9	2.7	0.205	0.92	0.09	2	141	73	12.4	1.4	0.68	24	8.59	0.55	23.4	14.5	6.7	1.79	0.4	7.6

Note: Sum of cations, in a neutral to alkaline soil, approximates the CEC (cation exchange capacity), 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, in this case estimated by the sum of cations.