SANDY CLAY LOAM OVER HEAVY BROWN CLAY

General Description: *Medium thickness hard sandy clay loam over a coarsely structured brown mottled heavy clay, calcareous with depth*

Landform: Very low rises within flat plains (ancient coastal back lagoons)

Substrate: Heavy clay (presumably overlying calcreted calcarenite at depth)

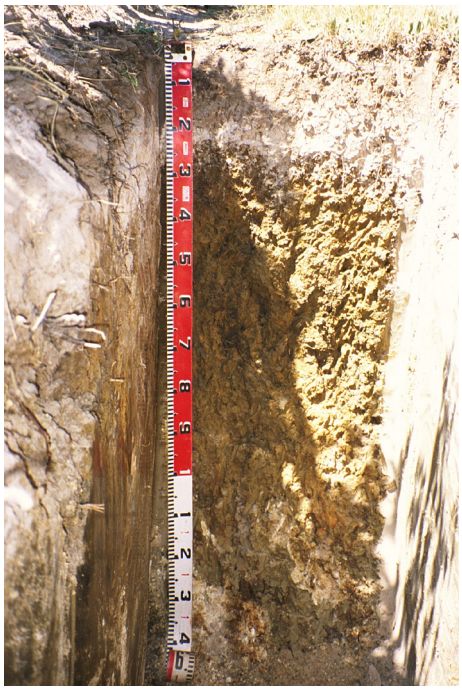
Vegetation:

Type Site:

Site No.:	SE116A	1:50,000 mapsheet:	7023-2 (Penola)
Hundred:	Penola	Easting:	486350
Section:	Bk 478	Northing:	5867660
Sampling date:	01/12/06	Annual rainfall:	655 mm average

Slight depression, 0% slope. Hard setting with no stones.

Soil Description:



Depth (cm)	*Description*
0-12	Dark greyish brown firm massive fine sandy clay loam with 2-10% calcrete fragments (6-20 mm). Clear to:
12-22	Light grey (bleached), with greyish brown and strong brown mottles, hard massive light sandy clay loam. Abrupt to:
22-45	Olive brown, dark greyish brown and yellowish brown very hard medium heavy clay with strong very coarse, breaking to strong fine, angular blocky structure. Diffuse to:
45-70	Dark greyish brown, olive brown and yellowish brown mottled very hard medium heavy clay with strong very coarse, breaking to strong fine, angular blocky structure. Diffuse to:
70-105	Light olive brown, and yellowish brown mottled very hard medium heavy clay with weak very coarse prismatic structure, breaking to coarse angular blocky. Gradual to:
105-145	Pale olive, olive yellow and strong brown mottled very hard medium heavy clay with strong coarse angular blocky structure and 20-50% fine carbonate segregations.

Classification: Hypercalcic, Mottled-Subnatric, Brown Sodosol; medium, non-gravelly, clay loamy / clayey, deep

Summary of Properties

Drainage: Imperfectly drained. Water may perch on top of the clayey subsoil for several week s at a time following heavy or prolonged rainfall.

Fertility: Inherent fertility is moderate, as indicated by the exchangeable cation data. At the sampling site, levels of phosphorus and zinc are marginally low. Reactive iron levels are high, suggesting high capacity for phosphate fixation.

pH: Alkaline at the surface (due to calcrete fragments scattered during establishment), neutral in the subsoil, and alkaline to strongly alkaline at depth.

Rooting depth: 145 cm in sampling pit, but few roots below 70 cm.

Barriers to root growth:

Physical: The high strength of the heavy clay subsoil restricts root growth, leading to uneven distribution and sub-optimal water use efficiency.

Chemical: Marginally high boron concentrations, sodicity and pH combine to restrict root growth in the deep subsoil.

Waterholding capacity: (Estimates for potential rootzone of grape vines)
Total available: 120 mm
Readily available: 45 mm

Seedling emergence: Fair to satisfactory, depending on condition of surface.

Workability: The hard medium textured surface shatters if worked too dry, and puddles if worked too wet.

Erosion Potential:

Water: Low.

Wind: Low.

Laboratory Data

Depth cm	pH H_2O	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	React Fe 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	
0-12	8.5	7.7	5.4	0.256	1.9	1.49	26	269	129	14.8	0.9	1244	22.4	174	23.1	2.95	15.7	12.5	1.52	1.00	0.66	6.4
12-22	8.4	7.7	1.9	0.087	1.04	0.32	2	75	45	6.1	0.4	587	1.92	113	3.78	0.33	6.5	5.28	0.59	0.47	0.17	7.2
22-45	7.8	6.9	1.1	0.27	0.89	0.64	3	388	102	17.5	1.7	878	1.53	94	6.94	0.27	25.2	11.4	10.2	2.52	1.05	10.0
45-70	7.6	6.7	0.2	0.15	0.7	0.49	2	426	77	22.9	3.4	576	0.95	39	36.3	0.18	24.8	8.32	12.9	2.39	1.10	9.7
70-105	8.8	7.8	1.3	0.328	1.09	0.26	2	430	83	21.6	6.2	514	0.76	29	47.6	0.21	25.9	7.99	14.2	2.63	1.07	10.2
105-145	9.4	8.3	34.6	0.422	1.62	0.14	2	437	131	35.6	5.0	445	0.65	13	3.79	0.15	26.3	9.39	11.6	4.19	1.09	15.9

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.

Further information: DEWNR Soil and Land Program