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: Medium clay (presumably overlying calcreted calcarenite at depth)

Vegetation:

Type Site: Site No.: SE116B

1:50,000 sheet:	7023-2 (Penola)	Hundred:	Penola
Annual rainfall:	625 mm	Sampling date:	01/12/06
Landform:	Slight depression, 0% slope.		
Surface:	Hard setting with no stones.		

Soil Description:

Depth (cm)	*Description*
0-13	Very dark greyish brown hard fine sandy clay loam with weak subangular blocky structure and 2-10% calcrete fragments (6-20 mm). Clear to:
13-30	Very dark grey, dark greyish brown and dark yellowish brown mottled extremely hard medium clay with weak coarse prismatic structure breaking to strong medium polyhedral. Diffuse to:
30-60	Brown, very dark grey and dark yellowish brown mottled extremely hard medium clay with weak coarse prismatic structure breaking to strong medium polyhedral. Diffuse to:
60-90	Dark grey and dark yellowish brown mottled extremely hard medium clay with strong coarse angular blocky structure and less than 2% fine carbonate segregations. Diffuse to:
90-120	Grey and yellowish brown mottled extremely hard medium clay with strong coarse angular blocky structure and less than 2% fine carbonate segregations. Diffuse to:
120-150	Pale olive and strong brown extremely hard medium clay with strong coarse angular blocky structure, more than 50% fine, and 2-10% nodular, 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 moderately high, as indicated by the exchangeable cation data. The low fertility bleached subsurface layer, common in these soils, is absent at this site, thereby improving nutrient status and retention capacity. Levels of all tested nutrient elements except zinc are satisfactory. Reactive iron levels are high, suggesting high capacity for phosphate fixation.

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

Rooting depth: 150 cm in sampling pit, but few roots below 60 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, pH and sodicity restrict root growth to some extent in the deep subsoil.

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

Total available: 110 mm
Readily available: 40 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 $CaC1_2$	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	
0-13	8.3	7.8	4.5	0.184	1.12	1.76	52	395	48	10.7	1.2	1483	21.6	103	19.8	2.04	19.2	14.8	2.39	1.07	0.93	5.6
13-30	7.7	6.6	0	0.12	0.57	1.08	8	325	26	5.9	1.0	1402	2.51	206	4.29	0.24	25.9	15.6	8.37	1.14	0.79	4.4
30-60	7.5	6.4	0	0.169	0.59	0.76	3	350	42	17.8	1.8	781	1.24	89	5.13	0.19	27.3	12.5	11.9	1.97	0.93	7.2
60-90	7.8	6.8	0	0.318	1.05	0.44	2	411	106	54.9	3.0	457	1.06	34	4.6	0.15	31.7	11.7	15.8	3.20	1.05	10.1
90-120	7.9	7.4	0	0.389	1.34	0.35	2	385	145	65	5.0	508	0.96	35	15.4	0.13	31.0	11.4	14.5	4.06	1.00	13.1
120-150	8.9	7.9	24.2	0.497	1.28	0.15	2	376	145	31.6	4.4	474	0.65	24	12.5	0.16	37.6	14.1	17.8	4.71	1.04	12.5

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.