GRADATIONAL CLAY LOAM OVER LIMESTONE

General Description: *Finely structured brown clay loam grading to a friable brown and yellow clay with ironstone gravel, overlying calcreted calcarenite within a metre*

Landform: Flat plains

Substrate: Calcreted calcarenite (old coastal dune or reef sediment) of the Bridgewater Formation

Vegetation:

Type Site: Site No.: SE117

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

Soil Description:

Depth (cm)	*Description*
0-12	Dark brown hard clay loam with strong medium polyhedral structure and 2-10% calcrete fragments (6-20 mm). Clear to:
12-30	Yellowish brown and dark yellowish brown firm light clay with strong medium polyhedral structure and 2-10% ironstone nodules (2-6 mm). Gradual to:
30-50	Yellowish brown, dark yellowish brown and red firm light clay with strong medium polyhedral structure and 10-20% ironstone nodules (2-6 mm). Gradual to:
50-70	Yellowish brown, dark yellowish brown and yellowish red firm light clay with moderate medium polyhedral structure and 20-50% ironstone nodules (2-6 mm). Sharp to:
70-85	Massive fractured calcrete. Clear to:
85-110	Very pale brown and yellow very highly calcareous soft light clayey coarse sand with more than 50% calcrete fragments.

Classification: Ferric, Petrocalcic, Brown Dermosol; medium, slightly gravelly, clay loamy / clayey, moderate

Summary of Properties

Drainage: Moderately well drained. The soil is unlikely to remain wet for more than a week following heavy or prolonged rainfall.

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

pH: Neutral to slightly alkaline at the surface, alkaline with depth.

Rooting depth: 110 cm in sampling pit, but few roots below 70 cm.

Barriers to root growth:

Physical: The calcrete severely restricts root growth, as indicated by the mat of roots lying on the surface of the pan. Some roots do however penetrate fractures.

Chemical: There are no apparent chemical barriers above the calcrete

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

Total available: 110 mm
Readily available: 50 mm

Seedling emergence: Satisfactory.

Workability: Provided organic matter levels are maintained, the surface is readily worked.

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	
0-12	7.8	7.2	0.5	0.094	0.50	2.25	13	561	20	7.7	1.6	1312	7.42	101	184	2.24	32.8	26.1	4.77	0.41	1.43	1.3
12-30	8.0	7.1	0	0.086	0.33	1.31	6	185	13	4.5	1.5	978	1.70	64	94.3	0.49	28.9	25.6	2.23	0.56	0.51	1.9
30-50	8.1	7.5	0	0.190	0.36	0.73	5	150	31	7.3	2.2	658	0.93	39	128	0.2	27.7	24.0	2.50	0.76	0.48	2.7
50-70	8.3	7.5	0	0.262	0.50	0.54	3	125	47	9.4	2.6	742	0.86	44	386	0.15	28.6	24.5	2.82	0.9	0.42	3.1
70-85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
85-110	9.1	7.9	89.0	0.110	0.59	0.14	2	113	28	6.3	0.6	245	0.58	7	6.35	0.29	16.7	14.9	1.06	0.41	0.30	2.5

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.