SANDY LOAM OVER POORLY STRUCTURED BROWN CLAY

General Description: *Sandy loam to loamy sand with a bleached A2 layer, over a coarsely structured brown mottled clay*

Landform: Alluvial plains.

Substrate: Medium textured silty alluvium.

Vegetation: Red gum (Euc. camaldulensis) woodland.

Type Site: Site No.: CH131A

1:50,000 sheet:	6727-3 (Alexandrina)	Hundred:	Bremer
Annual rainfall:	390 mm	Sampling date:	25/06/02
Landform:	Alluvial plain, 0% slope		
Surface:	Hard setting with no stones		

Soil Description:

Depth (cm)	*Description*
0-12	Dark brown firm fine sandy clay loam with moderate granular structure (recent wash deposit). Clear to:
12-27	Dark brown firm massive light sandy clay loam (original soil surface). Abrupt to:
27-60	Brown (bleached when dry) firm massive loamy sand. Abrupt to:
60-100	Dark brown, strong brown and red mottled extremely hard medium clay with moderate very coarse prismatic breaking to strong coarse angular blocky structure. Gradual to:
100-140	Strong brown, greyish brown and dark red mottled extremely hard fine sandy light clay with weak coarse prismatic breaking to weak subangular blocky structure. Gradual to:
140-170	Strong brown, greyish brown and dark red mottled hard silty clay loam with weak coarse subangular blocky structure.

Classification: Eutrophic, Mottled-Subnatric, Brown Sodosol; thick, non-gravelly, loamy / clayey, deep

Summary of Properties

Drainage: Moderately well drained. Water perches on the tight clayey subsoil for a week or so following heavy or prolonged rainfall, but depth to top of clay lessens the impact of the resulting waterlogging.

Fertility: Inherent fertility is moderate, as indicated by the exchangeable cation data. The topsoil has adequate nutrient retention capacity, but subsurface layers, particularly the bleached 27-60 cm layer with low clay and organic matter content, have poor capacity. Of the tested nutrient elements, phosphorus levels are low, but other concentrations are adequate. High surface sulphate levels indicate applied gypsum.

pH: Slightly alkaline throughout, except for the bleached layer which is neutral.

Rooting depth: Some vine roots to 140 cm, but most are in the upper 27 cm.

Barriers to root growth:

Physical: The tight clayey subsoil severely restricts root growth; most roots that do grow are confined to aggregate surfaces. The bleached layer with very poor moisture retention characteristics also limits root growth.

Chemical: There are no toxic limitations, but low nutrient retention capacity of the bleached subsurface layer impedes growth.

Water holding capacity: Approximately 170 mm total available water in the upper 150 cm of soil, but only about 75 mm is effectively available due to poor root density. There are 20-25 mm readily available water in the effective root zone (0-27 cm).

Seedling emergence: Fair due to hard setting sealing surface. Gypsum helps alleviate the problem.

Workability: The hard surface has a narrow moisture range over which it can be worked without shattering (too dry) or puddling (too wet). Gypsum application broadens the range.

Erosion Potential

Water: Low.

Wind: Low.

Laboratory Data

Depth cm	pH H_2O	pH $CaC1_2$	CO_3 %	EC1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	SO_4-S mg/kg	Boron mg/kg	Trace Elements mg/kg (DTPA)				Sum of cations cmol (+)/kg	Exchangeable Cations cmol(+)/kg				ESP
											Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
Row	8.1	7.3	0	0.27	-	2.40	24	415	97.6	1.8	9.40	30	7.93	14.3	17.7	12.49	2.91	1.27	1.05	7.2
0-12	7.9	7.3	0	0.41	-	1.71	11	407	258	1.7	6.95	25	5.42	10.8	17.2	11.64	3.39	1.09	1.03	6.4
12-27	8.1	7.1	0	0.13	-	0.85	3	248	34.4	1.0	2.83	19	4.24	3.14	10.3	6.23	2.69	0.81	0.58	7.9
27-60	7.2	6.2	0	0.04	-	0.21	3	136	10.1	0.5	0.41	9.3	2.32	0.61	3.9	1.95	1.26	0.34	0.36	8.7
60-100	7.9	7.0	0	0.15	-	0.27	3	347	43.8	1.1	1.12	16	5.52	0.31	12.7	5.51	4.96	1.35	0.85	10.7
100-140	8.1	7.1	0	0.15	-	0.16	3	291	53.4	1.2	0.82	8.0	3.08	0.36	10.5	4.43	3.91	1.39	0.74	13.3
140-170	8.0	7.1	0	0.18	-	0.15	3	260	68.2	1.0	0.71	10	2.95	0.38	8.6	3.50	3.14	1.30	0.62	15.2

Note: Row sample bulked from cores (0-10 cm) taken along the planting rows near the pit.

Sum of cations is a measure of the soil's capacity to store and release major nutrient elements. In neutral to alkaline soils the sum is approximately equivalent to CEC (cation exchange capacity).

ESP (exchangeable sodium percentage) is derived by dividing the exchangeable sodium value by the CEC, which at this site is estimated from the sum of cations.