SANDY LOAM OVER POORLY STRUCTURED BROWN CLAY

General Description: *Massive loamy sand to sandy loam with a strongly bleached A2 horizon overlying a brown and yellow mottled very firm heavy clay with slickensides, distinctively olive coloured at depth*

Landform: Gentle to moderate slopes

Substrate: Heavy clay probably derived from the weathering of quartzitic rocks

Vegetation: Blue gum / red gum woodland

Type Site: Site No.: CH074

1:50,000 sheet:	6627-4 (Noarlunga)	Hundred:	Kuitpo
Annual rainfall:	830 mm	Sampling date:	24/11/94
Landform:	Mid slope of a very gently inclined outwash fan, 3% slope		
Surface:	Hard setting with no stone		

Soil Description:

Depth (cm)	*Description*
0-9	Dark brown massive fine sandy loam. Abrupt to:
9-16	White massive fine sandy loam with 10-20% ironstone gravel. Sharp to:
16-30	Yellowish brown mottled heavy clay with strong coarse prismatic structure. Clear to:
30-60	Yellowish brown and olive mottled heavy clay with very coarse strong prismatic structure and slickensides. Diffuse to:
60-100	Olive and grey mottled heavy clay with very coarse strong prismatic structure and slickensides. Diffuse to:
100-145	Yellowish brown, grey brown and dark brown mottled medium clay with coarse subangular blocky structure.

Classification: Bleached-Vertic, Eutrophic, Brown Chromosol; medium, non-gravelly, loamy/clayey, very deep

Summary of Properties

Drainage Imperfect. The tight clay subsoil clay has very low permeability and will cause water to "perch" in the bleached layer for weeks at a time. Bleaching is extreme, and the clay has dull mottled colours, both indicating seasonal waterlogging.

Fertility The soil has a high capacity to store nutrients (as indicated by the high CEC in the subsoil). However, the surface soil CEC is only high because of its organic matter (note low value for 9-16 cm layer). Phosphorus levels are very high, but potassium is deficient. Leaching has also reduced calcium and particularly magnesium to moderately low levels. Sulphur and trace elements are adequate.

pH Acidic at the surface, slightly alkaline with depth. Dolomite is required for acidity correction to help raise the magnesium level.

Rooting depth 100 cm in pit, but there are few roots below 60 cm.

Barriers to root growth

Physical: Very tight clay, making good root proliferation almost impossible. This means that plants cannot make efficient use of stored moisture in the subsoil.

Chemical: Marginal acidity, marginal levels of some nutrients and an impoverished sub-surface layer restrict root development. Subsoil sodicity may be a problem where this layer is closer to the surface.

Water holding capacity Approximately 70 mm in the root zone (moderate to moderately low), and not all is available due to poor root distribution patterns.

Seedling emergence Fair, due to hard setting surface; maintenance of organic matter is vital.

Workability Fair. This soil rapidly changes from being too wet to being too dry.

Erosion Potential

Water: Moderately low, due to the slight slope.

Wind: Heavy grazing and pulverizing could result in wind erosion.

Laboratory Data

Depth cm	pH H_2O	pH $CaCl_2$	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 (EDTA)				CEC cmol (+)/kg	Exchangeable Cations cmol(+)/kg				ESP	Ext Al mg/kg
											Cu	Fe	Mn	Zn		Ca	Mg	Na	K		
Paddock	5.9	5.1	0	0.06	0.34	3.4	146	31	11.1	0.7	3.92	644	41	48	11.3	6.57	0.86	0.19	0.14	1.7	2
0-9	5.9	5.0	0	0.07	0.38	4.8	198	34	7.1	0.7	-	-	-	-	13.3	7.49	0.83	0.29	0.13	2.2	3
9-16	5.5	4.7	0	0.03	0.27	0.7	37	9	7.7	0.4	-	-	-	-	4.0	1.39	0.43	0.12	0.04	3.0	3
16-30	5.7	5.2	0	0.07	0.31	0.8	<4	102	25.0	1.8	-	-	-	-	31.5	13.19	10.59	0.90	0.41	2.9	-
30-60	6.9	5.9	0	0.12	0.44	0.3	<4	107	54.7	3.1	-	-	-	-	26.9	8.77	11.50	1.90	0.33	7.1	-
60-100	6.7	6.0	0	0.26	1.23	0.2	<4	68	91.2	2.9	-	-	-	-	21.7	6.45	9.04	2.35	0.20	10.8	-
100-145	7.7	7.1	0	0.77	3.56	0.2	<4	116	181	4.0	-	-	-	-	25.8	9.09	9.94	7.09	0.26	27.5	-

Note: Paddock sample bulked from 20 cores (0-10 cm) taken around the pit.

CEC (cation exchange capacity) is 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.