HARD LOAMY SAND OVER DISPERSIVE RED CLAY

General Description: *Thin hard sandy topsoil over a coarsely structured, dispersive red or brown mottled clay, calcareous with depth, grading to Tertiary sandy clay*

Landform: Slopes of gently undulating rises.

Substrate: Fine to medium grained Tertiary sediments, capped by fine carbonate.

Vegetation: Blue gum (Eucalyptus leucoxylon) woodland.

Type Site:

Site No.:	SE077	1:50,000 mapsheet:	7025-2 (Tatiara)
Hundred:	Tatiara	Easting:	492700
Section:	335	Northing:	5983150
Sampling date:	21/09/2004	Annual rainfall:	475 mm average

Upper slope of gentle rise, 2% slope. Hard setting surface with minor ironstone fragments and clods of subsoil brought up by recent delving.

Soil Description:

Depth (cm)	*Description*
0-8	Brown soft (cultivated) massive loamy sand with clods (to 2 cm) of subsoil clay. Sharp to:
8-30	Strong brown and brown mottled hard sandy medium clay with strong very coarse columnar structure. Gradual to:
30-55	Light yellowish brown and strong brown mottled firm sandy medium heavy clay with moderate coarse subangular blocky structure. Clear to:
55-90	Light yellowish brown and reddish yellow firm highly calcareous sandy medium clay with weak coarse structure and 20-50% fine carbonate segregations. Diffuse to:
90-130	Light yellowish brown and reddish yellow hard moderately calcareous sandy medium clay with weak coarse structure and 20-50% fine carbonate segregations.

Classification: Hypercalcic, Mottled-Mesonatric, Brown Sodosol; thin, non-gravelly, sandy / clayey, moderate

Summary of Properties

Drainage: Imperfectly drained. Water perches on the surface of the subsoil clay, saturating the lower topsoil and upper subsoil for periods of up to several weeks following heavy or prolonged rainfall.

Fertility: Inherent fertility is low, as indicated by the exchangeable cation data and low clay content of the surface. However, the shallow clayey subsoil has high nutrient retention capacity. Test results indicate possible deficiencies of copper, zinc and manganese. Regular phosphorus and nitrogen applications are essential. Gypsum will help to increase the Ca:Mg ratio, as well as improving surface condition.

pH: Slightly acidic at the surface, strongly alkaline with depth.

Rooting depth: 90 cm in pit, but roots below 55 cm are confined to macropores (old root channels).

Barriers to root growth:

Physical: The hard, coarsely structured, dispersive subsoil confines most root growth to the surfaces of the aggregates, resulting in poor root distribution patterns.

Chemical: High pH and sodicity impede root growth below 30 cm.

Waterholding capacity: Approximately 60 mm in the rootzone, but not all available due to poor root distribution in clay subsoil.

Seedling emergence: Fair, due to tendency for surface to seal over. Water repellence may be a problem in some seasons.

Workability: Satisfactory.

Erosion Potential:

Water: Moderate. Soils with thin sandy surfaces and slowly permeable subsoil clays are highly erodible. Even gentle slopes are vulnerable to sheet and rill erosion.

Wind: Moderately low to moderate, depending on sandiness of surface

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 mg/kg	Boron mg/kg	Trace Elements mg/kg (EDTA)				Sum cations cmol (+)/kg	Exchangeable Cations cmol(+)/kg				Est ESP
												Cu	Fe	Zn	Mn		Ca	Mg	Na	K	
0-8	6.3	5.4	0	0.05	0.53	1.14	56	134	9	6.1	1.1	0.85	198	1.06	3.64	7.3	4.54	2.16	0.23	0.36	3.2
8-30	7.5	6.8	0	0.18	1.40	0.38	7	189	29	27	2.7	0.53	73	0.1	2.84	17.3	5.64	8.34	2.83	0.5	16.3
30-55	9.6	8.5	1	0.60	2.39	0.18	5	354	210	66	6.7	0.42	23	0.25	3.82	24.9	6.02	11.3	6.64	0.92	26.6
55-90	9.3	8.5	24	0.89	3.66	0.25	6	386	406	99	5.7	0.37	9	0.28	1.55	28.3	9.86	10.5	7.04	0.99	24.8
90-130	9.6	8.6	12	0.82	3.98	0.12	2	323	520	62	5.6	0.47	14	0.46	0.35	23.3	6.99	9.17	6.31	0.85	27.1

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 estimated by dividing the exchangeable sodium value by the sum of cations.

Further information: DEWNR Soil and Land Program