SANDY LOAM OVER MOTTLED BROWN CLAY

General Description: *Thick massive sandy loam to loamy sand with a bleached and ironstone gravelly A2 layer, abruptly overlying a brown mottled heavy clay, weakly calcareous with depth.*

Landform: Outwash fans and alluvial flats in hilly landscapes

Substrate: Alluvial clay.

Vegetation: Red gum woodland.

Type Site:

Site No.:	CM097	1:50,000 mapsheet:	6630-3 (Clare)
Hundred:	Clare	Easting:	279550
Section:	65	Northing:	6248450
Sampling date:	12/05/2004	Annual rainfall:	595 mm average

Alluvial fan adjacent undulating low hills. Hard setting surface with 3% slope and no stones. Buffer strip between vineyard and road reserve.

Soil Description:

Depth (cm)	*Description*
0-12	Dark brown friable massive fine sandy loam. Clear to:
12-30	Dark greyish brown and pale brown mottled friable massive loamy fine sand. Clear to:
30-38	Very pale brown friable massive fine sandy loam with 20-50% ironstone gravel (2-6 mm). Abrupt to:
38-60	Yellowish brown, light olive brown and strong brown mottled very hard heavy clay with weak very coarse prismatic breaking to medium polyhedral structure. Diffuse to:
60-100	Yellowish brown, greyish brown and strong brown mottled very hard heavy clay with weak coarse prismatic breaking to polyhedral structure and 2-10% manganese segregations. Diffuse to:
100-140	Brown and yellowish brown mottled very hard heavy clay with moderate coarse prismatic breaking to blocky structure, 2-10% manganese veins and a trace of fine carbonate segregations.

Classification: Bleached-Mottled, Hypocalcic, Brown Chromosol; thick, non-gravelly, loamy / clayey, deep

Summary of Properties

Drainage: Imperfectly drained. The heavy clay subsoil perches water so saturation of at least part of the topsoil is likely for periods of several weeks following heavy or prolonged rainfall.

Fertility: Inherent fertility is low as indicated by the exchangeable cation data of the surface soil. The low clay content restricts the capacity of the soil to retain nutrients. However, the clayey subsoil has significantly higher capacity to store and release cations such as calcium, magnesium and potassium. Phosphorus levels are very low, but site is outside the planted area.

pH: Acidic at the surface, neutral to slightly alkaline at depth. Lime is needed to correct acidity.

Rooting depth: Roots (pasture plants) to 60 cm, but few below 38 cm.

Barriers to root growth:

Physical: The dense subsurface soil, and the coarsely structured heavy clay subsoil both impose physical restrictions on root growth.

Chemical: There are no chemical barriers, other than low fertility status, which can be readily restored.

Waterholding capacity: Approximately 60 mm (total available) for annual crop and pasture plants. Approximately 30 mm (readily available) in potential grape vine rootzone of 60 cm.

Seedling emergence: Fair due to hard setting, sealing surface.

Workability: Fair to satisfactory depending on organic matter levels of surface.

Erosion Potential:

Water: Moderately low, provided that run-on water from upslope is controlled.

Wind: Moderately low – fine sandy surface can become powdery if excessively cultivated or over-grazed.

Laboratory Data

Depth cm	pH H_2O	pH $CaCl_2$	CO_3 %	EC 1:5 dS/m	ECe dS/m	Cl mg/kg	Org.C %	Avail. P mg/kg	Avail. K mg/kg	SO_4 mg/kg	Boron mg/kg	Trace Elements mg/kg (DTPA)				Sum cations cmol (+)/kg	Exchangeable Cations cmol(+)/kg				ESP
												Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
0-12	6.0	4.9	0	0.035	0.262	3	1.55	5	160	3.9	0.4	-	-	-	-	4.3	3.28	0.59	0.06	0.37	1.4
12-30	5.8	4.6	0	0.016	0.198	2	0.61	4	82	2.1	0.3	-	-	-	-	3.1	2.42	0.49	0.05	0.17	1.6
30-38	5.9	4.7	0	0.014	0.181	4	0.56	4	73	2.7	0.3	-	-	-	-	3.7	2.63	0.72	0.11	0.19	3.0
38-60	6.2	4.6	0	0.019	0.119	4	0.64	4	167	3.2	1.2	-	-	-	-	24.9	13.1	10.8	0.44	0.48	1.8
60-100	6.7	5.1	0	0.022	0.131	1	0.35	1	143	5.9	1.1	-	-	-	-	18.6	9.58	8.30	0.35	0.40	1.9
100-140	7.9	7.0	0	0.082	0.165	5	0.26	6	164	7.6	0.9	-	-	-	-	19.7	12.0	6.77	0.46	0.42	2.3

Note: Sum of cations is an estimate of cation exchange capacity, a measure of the soil's capacity to store and release nutrient elements.
ESP (exchangeable sodium percentage) is derived by dividing the exchangeable sodium value by the sum of cations.

Further information: DEWNR Soil and Land Program