LOAM OVER HARD RED CLAY ON CALCAREOUS ROCK

General Description: *Sandy loam to loam over coarsely structured red clay, calcareous with depth, on basement rock.*

Landform: Slopes of undulating to rolling rises and low hills.

Substrate: Quartzitic siltstone, shale or fine sandstone mantled by fine carbonate.

Vegetation:

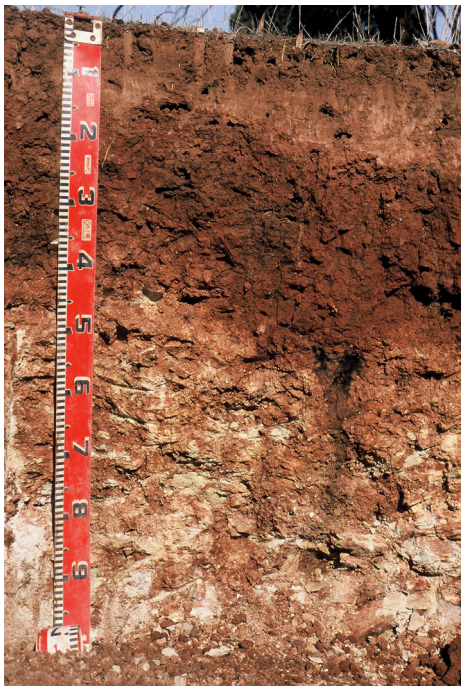
Type Site:

Site No.:	CM102	1:50,000 mapsheet:	6629-4 (Halbury)
Hundred:	Upper Wakefield	Easting:	288950
Section:	414	Northing:	6234950
Sampling date:	12/05/2004	Annual rainfall:	530 mm average

Upper slope in landscape of undulating rises, 4% slope. Hard setting surface with up to 2% quartz stone (20-60 mm).

Soil Description:

Depth (cm)	*Description*
0-8	Dark reddish brown firm massive loam. Clear to:
8-14	Pink (bleached) firm massive loam with 2-10% sandstone fragments (6-20 mm). Abrupt to:
14-35	Dark reddish brown very hard medium clay with strong medium prismatic breaking to medium polyhedral structure. Clear to:
35-75	Red very hard very highly calcareous medium clay with strong medium subangular blocky structure, 20-50% fine carbonate segregations and 10-20% siltstone fragments. Gradual to:
75-100	Weathering siltstone with 10-20% fine carbonate segregations and minor clay pockets in fissures.



Classification: Hypercalcic, Subnatric, Red Sodosol; medium, non-gravelly, loamy / clayey, moderate

Summary of Properties

Drainage: Well to moderately well drained. Although there is some restriction of water movement at the topsoil - subsoil boundary, the soil is unlikely to remain saturated for more than a week at a time, and generally only a few days. Soils such as at this site, with thin topsoils, are more susceptible to the impacts of perched watertables.

Fertility: Inherent fertility is moderately high, as indicated by the exchangeable cation data. The high exchangeable calcium values in the surface are largely attributable to high organic carbon – otherwise the soil has a moderate capacity to store and release nutrients. Apart from nitrogen and phosphorus, other deficiencies are unlikely.

pH: Mildly alkaline at the surface, alkaline with depth.

Rooting depth: 75 cm in the pit.

Barriers to root growth:

Physical: The clayey subsoil imposes some restriction on root growth. The underlying rock also affects root development where it occurs at shallow depth (eg less than 50 cm), but roots are generally able to penetrate the fissures, especially where the bedding planes of the rock are near vertical.

Chemical: Elevated salt levels (EC and chloride) from 35 cm will affect sensitive plants. In an irrigated situation, these are leachable.

Waterholding capacity: Approximately 70 mm (total available) for annual crop and pasture plants. Approximately 35 mm (readily available) in potential grape vine rootzone of 55 cm.

Seedling emergence: Fair to satisfactory, depending on condition of surface soil. Sealing of the surface is common, with consequent impact on emergence.

Workability: Fair to satisfactory. Surface condition readily degrades, so that soil puddles if worked too wet, and shatters if worked too dry.

Erosion Potential:

Water: Moderate.

Wind: Low.

Laboratory Data

Depth cm	pH H_2O	pH $CaCl_2$	CO_3 %	EC1:5 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	
0-8	7.8	7.0	0	0.17	0.994	56	3.03	14	471	24	0.9	-	-	-	-	19.7	14.8	3.62	0.36	0.94	1.8
8-14	8.2	7.3	0	0.22	0.749	66	1.11	4	290	24	0.9	-	-	-	-	16.8	11.3	3.95	0.66	0.60	3.9
14-35	8.6	7.6	1.4	0.46	2.03	371	0.73	3	641	46	2.2	-	-	-	-	33.6	17.6	11.0	3.33	1.62	9.9
35-75	8.8	7.9	11.7	1.17	6.96	1332	0.56	6	813	119	3.0	-	-	-	-	34.3	15.4	10.9	6.46	1.56	18.8
75-100	9.2	8.1	11.2	1.03	6.22	1027	0.76	5	909	101	2.2	-	-	-	-	26.3	10.7	7.76	6.74	1.10	25.6

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