

## HARD LOAM OVER RED CLAY ON WEATHERING ROCK

**General Description:** *Hard red brown loam over a well structured red clay, calcareous with depth, forming in weathering fine grained basement rock*

**Landform:** Slopes of undulating rises and low hills.

**Substrate:** Fine grained basement rock (fine schist of the Saddleworth Formation at this site), mantled by soft carbonate.

**Vegetation:**



**Type Site:** Site No.: CL044A  
 1:50,000 sheet: 6628-1 (Barossa)      Hundred: Nuriootpa  
 Annual rainfall: 505 mm      Sampling date: 29/11/04  
 Landform: Lower slope of undulating low hill, 6% slope  
 Surface: Hard setting with no stones

### Soil Description:

Depth (cm)	Description
0-20	Reddish brown hard massive loam. Clear to:
20-40	Dark reddish brown firm medium heavy clay with strong medium polyhedral structure. Diffuse to:
40-75	Dark reddish brown firm medium heavy clay with strong medium polyhedral structure. Clear to:
75-100	Dark red firm moderately calcareous medium clay with strong polyhedral structure and 20-50% soft carbonate segregations. Diffuse to:
100-150	Red firm highly calcareous medium clay with moderate polyhedral structure, 20-50% soft carbonate segregations and 20-50% soft weathering siltstone fragments.



**Classification:** Haplic, Hypercalcic, Red Chromosol; medium, non-gravelly, loamy / clayey, deep

### Summary of Properties

**Drainage:** Well drained. The soil is unlikely to remain saturated for more than a couple of days following heavy or prolonged rainfall.

**Fertility:** Inherent fertility is moderately high, as indicated by the exchangeable cation data. The surface soil has satisfactory nutrient retention capacity, while subsoil reserves of calcium, magnesium and potassium are high. Of the tested nutrients, only zinc is possibly deficient. The relatively low calcium:magnesium ratio can be corrected by applying gypsum, which will also help improve surface condition (see below).

**pH:** Neutral at the surface, alkaline with depth.

**Rooting depth:** 120 cm in pit, but few roots below 75 cm.

**Barriers to root growth:**

**Physical:** There are no significant physical barriers.

**Chemical:** There are no apparent chemical barriers.

**Water holding capacity:** (Estimates for potential root zone of irrigated crops)

Total available: 135 mm  
 Readily available: 60 mm

**Seedling emergence:** Fair to satisfactory, depending on degree of hard setting at the surface. Gypsum will improve condition.

**Workability:** Fair to satisfactory, depending on degree of hard setting. Soil is likely to shatter if worked too dry, or puddle if worked too wet. Gypsum will improve workability.

**Erosion Potential**

**Water:** Moderate, due to slope.

**Wind:** Low.

### Laboratory Data

Depth cm	pH H <sub>2</sub> O	pH CaCl <sub>2</sub>	CO <sub>3</sub> %	EC 1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	Cl mg/kg	SO <sub>4</sub> -S mg/kg	Boron mg/kg	Trace Elements mg/kg (EDTA)				Sum cations cmol (+)/kg	Exchangeable Cations cmol(+)/kg				Est. ESP
												Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
0-20	6.9	6.2	0	0.112	0.69	1.48	115	823	64	4.7	0.7	15.6	174	263	3.29	10.6	6.9	1.54	0.17	2.03	1.6
20-40	7.2	6.3	0	0.063	0.39	0.81	7	491	15	15.3	1.0	6.40	74	189	0.61	23.2	14.8	6.80	0.39	1.22	1.7
40-75	7.5	6.6	0	0.067	0.39	0.63	4	419	17	15.2	1.1	6.30	55	129	0.36	29.9	18.6	9.69	0.54	1.12	1.8
75-100	8.7	7.9	17.6	0.166	0.65	0.21	5	457	50	9.4	1.1	1.79	10	12.4	0.31	29.0	17.3	10.3	0.49	1.05	1.7
100-150	9.0	8.1	28.7	0.163	0.56	0.16	2	376	32	10.0	1.3	1.39	9	0.62	0.49	24.8	13.1	10.3	0.43	0.88	1.7

**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 derived by dividing the exchangeable sodium value by the CEC, in this case estimated by the sum of cations.