

## SHALLOW LOAMY SAND OVER CALCRETE

**General Description:** *Up to 50 cm soft reddish loamy sand with variable rubble content, over rubbly to sheet calcrete*

**Landform:** Gently undulating rises.

**Substrate:** Calcrete capped highly calcareous windblown material (Woorinen Formation, overlying heavy clay (Blanchetown Clay equivalent)).

**Vegetation:** Mallee.



**Type Site:** Site No.: MP012

1:50,000 sheet: 6727-3 (Alexandrina)      Hundred: Freeling  
Annual rainfall: 360 mm      Sampling date: 06/12/04  
Landform: Crest of gently undulating rise  
Surface: Soft with 2-10% calcrete stone (60-200 mm)

**Soil Description:**

Depth (cm)	Description
0-10	Light brown loose sand (applied prior to vineyard establishment to reduce surface pH). Sharp to:
10-25	Reddish brown soft light loamy sand. Clear to:
25-40	Dark reddish brown soft massive loamy sand with 10-20% calcrete fragments (60-200 mm). Depth varies from 40-50 cm. Clear to:
40-60	Rubbly calcrete. Gradual to:
60-80	Reddish yellow massive very highly calcareous clayey sand with more than 50% weakly cemented calcrete fragments (semi-hard pan). Gradual to:
80-130	Reddish yellow friable massive very highly calcareous light sandy clay loam with 20-50% calcrete fragments (6-20 mm). Diffuse to:
130-180	Brown and reddish brown mottled firm heavy clay with strong coarse angular blocky structure and 2-10% fine carbonate segregations.



**Classification:** Basic, Petrocalcic, Leptic Tenosol; medium, slightly gravelly, sandy / sandy, shallow

## Summary of Properties

- Drainage:** Well drained. Soil rarely remains wet for more than a day or so following heavy or prolonged rainfall. However, deep drainage is impeded by the heavy clay substrate. Inefficient irrigation may lead to water table development and salt accumulation.
- Fertility:** Inherent fertility is moderately low, as indicated by the exchangeable cation data and low clay content. The original surface loamy sand (10-40 cm), and the applied sandy top-dressing both have limited nutrient retention capacities. At the sampling site, the 0-10 cm layer has probable deficiencies of phosphorus, copper, zinc and manganese. The original surface soil appears to be deficient in copper and zinc.
- pH:** Alkaline at the surface, strongly alkaline with depth.
- Rooting depth:** 130 cm in pit, but few roots below 80 cm.
- Barriers to root growth:**
- Physical:** The calcrete presents a variable barrier, depending on degree of cementation. Rubbly forms (as at this site) are only slightly limiting. Associated sheet calcrete must be ripped pre-plant for root penetration.
- Chemical:** There are no chemical barriers above the deep substrate clay (Blanchetown Clay equivalent) at 130 cm. However, root growth in the high carbonate layers diminishes as the rubble content decreases between 60 and 130 cm.
- Water holding capacity:** (Estimates for potential root zone of grape vines after ripping)
- Total available: 65 mm  
Readily available: 40 mm
- Seedling emergence:** Satisfactory, provided surface does not develop water repellence.
- Workability:** Surface is easily worked over a range of moisture contents.
- Erosion Potential**
- Water:** Low.
- Wind:** Moderately 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	Zn	Mn		Ca	Mg	Na	K	
0-10	8.7	7.9	1.8	0.134	1.49	0.14	18	123	62	5.1	0.5	0.21	38	0.10	6.12	4.5	3.17	0.66	0.36	0.35	7.9
10-25	8.7	7.9	0.9	0.150	1.40	0.60	33	199	53	7.2	0.8	0.34	50	0.92	18.0	8.7	6.73	0.93	0.53	0.52	6.1
25-40	8.7	7.9	0.8	0.182	1.14	0.68	14	272	59	7.8	1.1	0.74	65	0.45	29.4	11.8	9.48	1.09	0.49	0.70	4.2
40-60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60-80	9.1	8.1	73.8	0.242	2.19	0.32	2	210	106	14.5	2.4	0.26	5.3	0.07	3.44	16.4	11.9	2.95	1.05	0.55	6.4
80-130	9.1	8.2	68.8	0.180	1.65	0.22	2	259	79	15.5	2.2	0.40	5.4	0.23	1.03	15.5	10.2	3.53	1.16	0.63	7.5
130-180	9.4	8.5	1.2	0.297	1.30	<0.05	7	624	71	19.5	9.4	0.79	22	0.10	54.3	21.4	5.69	8.85	5.22	1.60	24.4

**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.