

IMPERFECTLY DRAINED HIGHLY LEACHED SAND

General Description: *Moderately deep loose sand overlying coffee rock (sand cemented by iron oxides and organic matter), grading to a yellow and brown sandy clay forming in soft red, yellow and grey sandstone*

- Landform:** Undulating rises and low hills
- Substrate:** Soft massive sandstone deposited in ancient glacial valleys
- Vegetation:** Eucalyptus baxteri / Eucalyptus cosmophylla scrub with dense understorey



- Type Site:** Site No.: CH014
- 1:50,000 sheet: 6627-3 (Willunga) Hundred: Myponga
- Annual rainfall: 850 mm Sampling date: 29/07/92
- Landform: Lower slope of undulating rise, 4% slope
- Surface: Loose with no stone

Soil Description:

| Depth (cm) | Description |
|------------|---|
| 0-23 | Dark grey loose sand. Clear to: |
| 23-70 | Light grey loose sand. Sharp to: |
| 70-95 | Reddish brown and dark brown hard massive clayey sand. Abrupt to: |
| 95-115 | Brownish yellow and yellowish brown fine sandy clay with weak polyhedral structure. Clear to: |
| 115-160 | Brownish yellow, yellow and red massive light sandy clay loam. Diffuse to: |
| 160-200 | Brownish yellow, light yellow brown and red massive light sandy clay loam. |



Classification: Parapanic, Humosesquic, Semiaquic Podsol; medium, non-gravelly, sandy / sandy, moderate

Summary of Properties

Drainage Imperfectly to moderately well drained. Soil may remain wet for a week to several weeks when water is unable to percolate through the coffee rock pan and underlying clay.

Fertility Natural fertility is low, due to the low clay content of the topsoil. The soil has a very low capacity to store nutrients (low CEC), which are easily leached from the topsoil, but trapped in the more clayey subsoil. The analyses indicate deficiencies of phosphorus, potassium, calcium, magnesium, sulphur, copper and manganese.

pH Acidic in the surface, strongly acidic at depth. Correction requires dolomitic lime.

Rooting depth 115 cm at type site, but density is moderate to low throughout.

Barriers to root growth

Physical: Very few roots grow in the coffee rock and must grow through cracks to reach the underlying clay. The coffee rock is usually not continuous.

Chemical: Low fertility and low pH are major limitations to satisfactory root development.

Water holding capacity 80 mm in root zone, but water use efficiency is low because of the sparse root system.

Seedling emergence Good, except where water repellence occurs (sporadic).

Workability Good.

Erosion Potential

Water: Low to moderately low. The deep sandy surface readily absorbs water (except where repellent, in which case there is a high risk of erosion).

Wind: Moderate, due to loose surface sand.

Laboratory Data

| Depth cm | pH H ₂ O | pH CaCl ₂ | CaCO ₃ % | EC1:5 dS/m | ECe dS/m | Org.C % | Avail. P mg/kg | Avail. K mg/kg | SO ₄ -S mg/kg | Boron mg/kg | Trace Elements mg/kg (DTPA) | | | | CEC cmol (+)/kg | Exchangeable Cations cmol(+)/kg | | | | ESP | Ext Al mg/kg |
|-------------|------------------------|-------------------------|------------------------|---------------|-------------|------------|----------------------|----------------------|-----------------------------|----------------|--------------------------------|-----|------|------|-----------------------|------------------------------------|------|------|------|-----|--------------------|
| | | | | | | | | | | | Cu | Fe | Mn | Zn | | Ca | Mg | Na | K | | |
| Paddock | 5.5 | 4.7 | 0 | 0.05 | 0.28 | 1.8 | 9 | 73 | 4.8 | 0.5 | 0.3 | 28 | 2.5 | 3.5 | 3.5 | 1.9 | 0.5 | <0.1 | 0.10 | na | - |
| | | | | | | | | | | | *0.6 | *46 | *8.2 | *5.1 | | | | | | | |
| 0-23 | 5.0 | 4.1 | 0 | 0.03 | 0.09 | 1.2 | <2 | 49 | 2.3 | 0.4 | 0.5 | 22 | 1.1 | 2.3 | 2.5 | 1.2 | 0.3 | <0.1 | 0.06 | na | 4.3 |
| 23-70 | 5.2 | 4.5 | 0 | 0.03 | 0.05 | 0.1 | <2 | 47 | 0.8 | 0.3 | <0.1 | 5 | <0.1 | 0.1 | 1.2 | <0.4 | <0.2 | <0.1 | 0.05 | na | - |
| 70-95 | 5.3 | 4.8 | 0 | 0.04 | 0.07 | 0.7 | 9 | 83 | 3.7 | 0.5 | <0.1 | 56 | <0.1 | <0.1 | 3.1 | 0.5 | 0.2 | <0.1 | 0.15 | na | - |
| 95-115 | 5.3 | 4.6 | 0 | 0.05 | 0.09 | 0.7 | <2 | 250 | 5.9 | 0.6 | <0.1 | 12 | <0.1 | <0.1 | 9.3 | 1.7 | 3.2 | 0.21 | 0.58 | 2.3 | - |
| 115-160 | 4.9 | 4.4 | 0 | 0.04 | 0.08 | 0.1 | <2 | 110 | 25 | 1.0 | <0.1 | 2 | <0.1 | <0.1 | 6.0 | 0.8 | 2.7 | 0.16 | 0.25 | 2.7 | 5.2 |
| 160-200 | 4.7 | 4.1 | 0 | 0.04 | 0.07 | 0.1 | <2 | 78 | 31 | 0.7 | <0.1 | 2 | <0.1 | <0.1 | 4.3 | <0.4 | 1.1 | 0.14 | 0.17 | 3.3 | - |

Note: Paddock sample bulked from 20 cores (0-10 cm) taken around the pit.

* EDTA trace element analyses on "paddock" sample.

CEC (cation exchange capacity) is 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.