

SANDY LOAM OVER POORLY STRUCTURED BROWN CLAY

General Description: *Thick sandy to loamy topsoil with a bleached subsurface layer overlying a brown, grey and red mottled clayey subsoil grading to alluvium derived from Kanmantoo Group rocks*

Landform: Lower slopes and flats in the central to north eastern Mount Lofty Ranges

Substrate: Medium to fine grained sediments derived from the erosion of micaceous rocks

Vegetation: Red gum woodland



| | | | | |
|-------------------|----------------|-------------|--------------------|----------------------|
| Type Site: | Site No.: | CH042 | 1:50,000 mapsheet: | 6628-2 (Onkaparinga) |
| | Hundred: | Onkaparinga | Easting: | 312700 |
| | Section: | 5281 | Northing: | 6130750 |
| | Sampling date: | 21/01/93 | Annual rainfall: | 825 mm average |

Valley flat between undulating low hills.

Soil Description:

| <i>Depth (cm)</i> | <i>Description</i> |
|-------------------|--|
| 0-15 | Dark greyish brown soft massive light sandy loam. Abrupt to: |
| 15-40 | Light grey with brown streaks, massive loamy sand with 10-20% quartz and ironstone gravel. Clear to: |
| 40-52 | Pale yellow and light yellowish brown weakly structured light sandy clay loam with 10-20% quartz gravel. Clear to: |
| 52-75 | Yellowish brown and greyish brown mottled sandy clay with coarse blocky structure and 2-10% quartz gravel. Clear to: |
| 75-95 | Yellowish brown, brownish grey and red mottled heavy clay with strong coarse prismatic structure. Gradual to: |
| 95-115 | Light grey, yellowish brown and white medium heavy clay with strong, coarse prismatic structure. |



Classification: Bleached-Mottled, Natric, Brown Kurosol; thick, non-gravelly, sandy / clayey, deep



Summary of Properties

- Drainage:** Imperfectly to poorly drained due to low permeability, sodic subsoil clay and low-lying position in the landscape. Soil may remain wet for several weeks or months.
- Fertility:** Natural fertility is moderate as indicated by the exchangeable cation data. Exchangeable calcium, magnesium and potassium are all marginally low, as is copper. The nutrient retention capacity of the upper 52 cm is low because of its low clay content, and relies on organic matter levels (2% organic carbon is adequate). Surface phosphorus and potassium levels are adequate at pit site.
- pH:** Acidic throughout. Dolomitic lime is needed to correct low pH.
- Rooting depth:** 115 cm in pit, but most roots are concentrated in the upper 15 cm.
- Barriers to root growth:**
- Physical:** Waterlogging and high strength sodic (24% ESP) clay subsoil retard root growth.
 - Chemical:** Low nutrient status of the 15-40 cm layer and acidity reduce root growth. Very high iron levels cause phosphate fixation. Salinity is also a likely problem, as indicated by the halophytic species present. Moderate electrical conductivity (EC) values indicate some salt accumulation.
- Waterholding capacity:** 140 mm in rootzone, but only about 50 mm are effectively available to plants because of low root density.
- Seedling emergence:** Good.
- Workability:** Good.
- Erosion Potential:**
- Water:** Low, although stream bank erosion and gullyng are significant in watercourses.
 - Wind:** Moderately low.

Laboratory Data

| Depth cm | pH H ₂ O | pH CaCl ₂ | CO ₃ % | EC1:5 dS/m | ECe dS/m | Org.C % | Avail. P mg/kg | Avail. K mg/kg | SO ₄ mg/kg | Boron mg/kg | Trace Elements mg/kg (EDTA) | | | | CEC cmol (+)/kg | Exchangeable Cations cmol(+)/kg | | | | ESP |
|-------------|------------------------|-------------------------|----------------------|---------------|-------------|------------|----------------------|----------------------|--------------------------|----------------|--------------------------------|-----|-----|------|-----------------------|------------------------------------|------|------|------|------|
| | | | | | | | | | | | Cu | Fe | Mn | Zn | | Ca | Mg | Na | K | |
| Paddock | 5.2 | 4.9 | 0 | 0.28 | 1.49 | 2.0 | 45 | 160 | - | 0.9 | 1.49 | 626 | 116 | 7.80 | 7.4 | 3.71 | 1.16 | 0.35 | 0.30 | 4.7 |
| 0-15 | 5.2 | 4.7 | 0 | 0.28 | 2.12 | 1.7 | 27 | 78 | - | 0.9 | - | - | - | - | 6.3 | 3.34 | 1.35 | 0.44 | 0.20 | 7.0 |
| 15-40 | 5.9 | 5.5 | 0 | 0.09 | 1.01 | 0.09 | 5 | 8 | - | 0.2 | - | - | - | - | 1.1 | 0.44 | 0.29 | 0.10 | 0.07 | n.s. |
| 40-52 | 5.4 | 4.9 | 0 | 0.27 | 2.77 | 0.05 | 4 | 47 | - | 0.6 | - | - | - | - | 4.1 | 0.97 | 1.62 | 0.74 | 0.14 | 18.0 |
| 52-75 | 5.2 | 4.8 | 0 | 0.45 | 2.76 | 0.07 | 3 | 94 | - | 1.6 | - | - | - | - | 8.6 | 2.24 | 4.16 | 2.06 | 0.28 | 24.0 |
| 75-95 | 4.9 | 4.7 | 0 | 0.82 | 3.56 | 0.18 | <2 | 120 | - | 3.2 | - | - | - | - | 19.2 | 5.21 | 9.58 | 4.42 | 0.38 | 23.0 |
| 95-115 | 5.1 | 4.9 | 0 | 0.75 | 3.54 | 0.08 | 2 | 94 | - | 3.0 | - | - | - | - | 15.2 | 3.97 | 8.09 | 3.91 | 0.27 | 25.7 |

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

Further information: [DEWNR Soil and Land Program](#)

