

SANDY LOAM OVER RED DISPERSIVE CLAY ON ROCK

General Description: *Red brown sandy to loamy surface soil overlying a red dispersive clayey subsoil, calcareous at depth*

Landform: Slopes of undulating to rolling rises and low hills of the eastern Mt. Lofty Ranges

Substrate: Highly micaceous schists of the Kanmantoo Group

Vegetation: Blue gum/sheoak woodland



Type Site: Site No.: CH060

1:50,000 sheet: 6728-3 (Tepko)

Hundred: Monarto

Annual rainfall: 525 mm

Sampling date: 19/01/94

Landform: Lower slope of a low rise at the top of the Bremer Escarpment, 5% slope

Surface: Hard setting with no stones. Saline seepage in watercourse down-slope

Soil Description:

| Depth (cm) | Description |
|------------|---|
| 0-5 | Dark reddish brown massive hard sandy loam with 2-10% quartz gravel. Abrupt to: |
| 5-12 | Reddish brown (bleached dry) massive hard loamy sand with 2-10% quartz gravel. Abrupt to: |
| 12-35 | Red hard medium clay with strong coarse columnar structure and 10-20% schist and sandstone gravel. Clear to: |
| 35-60 | Red light clay with blocky structure, minor soft segregations and more than 50% schist and sandstone fragments. Clear to: |
| 60-100 | Red and dark brown mottled calcareous light clay with moderate blocky structure and 2-10% soft carbonate. Clear to: |
| 100-130 | Weathering schist with minor soft carbonate segregations. |



Classification: Calcic, Subnatric, Red Sodosol; medium, slightly gravelly, loamy / clayey, deep

Summary of Properties

| | |
|--------------------------------|---|
| Drainage | The soil is moderately well to imperfectly drained. Waterlogging may be a problem in some years. |
| Fertility | The subsoil clay has a high capacity to store and supply nutrients, but the low clay content surface does not. Magnesium, calcium, copper, zinc and manganese are all marginally deficient. Organic carbon levels are high. |
| pH | Acidic at the surface, strongly alkaline with depth. Application of lime is needed to correct pH. |
| Rooting depth | 60 cm in pit, but very few roots below 35 cm. |
| Barriers to root growth | |
| Physical: | Poor soil structure prevents even root distribution. |
| Chemical: | Very high subsoil pH inhibits nutrient uptake and is probably the main limitation to satisfactory subsoil root growth. |
| Water holding capacity | Approx. 120 mm in profile, but at least half is unavailable due to poor root distribution. Poor water use contributes to down-slope salinization. |
| Seedling emergence | Fair due to hard setting surface. This is caused by high fine sand content and high exchangeable sodium (ESP). |
| Workability | Fair due to poor surface structure. Soil changes quickly from being too wet to too dry, limiting time for effective cultivation. |
| Erosion Potential | |
| Water: | Moderate, due to high surface erodibility and slope. |
| Wind: | Moderately low. |

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 |
|-------------|------------------------|-------------------------|------------------------|---------------|-------------|------------|----------------------|----------------------|-----------------------------|----------------|--------------------------------|------|-----|------|-----------------------|------------------------------------|------|------|------|------|
| | | | | | | | | | | | Cu | Fe | Mn | Zn | | Ca | Mg | Na | K | |
| Paddock | 5.9 | 4.8 | 0 | 0.08 | 0.49 | 1.9 | 19 | 280 | - | 1.1 | 0.6 | 168 | 5.7 | 0.5 | 7.4 | 4.17 | 1.27 | 0.57 | 0.58 | 7.3 |
| | | | | | | | | | | | *0.8 | *197 | *10 | *0.9 | | | | | | |
| 0-5 | 5.8 | 4.7 | 0 | 0.09 | 0.64 | 2.6 | 28 | 284 | - | 0.9 | 0.8 | 239 | 5.2 | 1.2 | 7.9 | 4.31 | 1.22 | 0.58 | 0.71 | 7.7 |
| 5-12 | 5.9 | 4.8 | 0 | 0.06 | 0.37 | 1.6 | 18 | 194 | - | 0.7 | 0.5 | 197 | 2.5 | 0.9 | 7.4 | 4.17 | 0.97 | 0.55 | 0.35 | 7.4 |
| 12-35 | 7.8 | 6.7 | 0 | 0.60 | 1.10 | 0.6 | <4 | 258 | - | 3.6 | 1.5 | 21 | 0.2 | 0.1 | 22.1 | 6.05 | 9.22 | 2.92 | 0.92 | 13.2 |
| 35-60 | 9.1 | 8.3 | 0.4 | 0.68 | 1.40 | 0.4 | <4 | 283 | - | 5.0 | 1.7 | 16 | 0.4 | 0.2 | 19.3 | 5.58 | 9.93 | 3.73 | 0.93 | 19.2 |
| 60-100 | 9.7 | 8.6 | 8.3 | 0.63 | 2.65 | 0.2 | <4 | 231 | - | 3.1 | 0.9 | 6 | 0.3 | 0.2 | 12.7 | 3.75 | 6.74 | 3.27 | 0.49 | 25.7 |

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

* EDTA trace element analyses for "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.