

SAND OVER SODIC BROWN CLAY

General Description: *Sandy surface soil with a bleached subsurface layer overlying a brown mottled columnar structured clay, with calcrete nodules at depth*

Landform: Flats between relict coastal dunes.

Substrate: Interbedded clays and limestones of the Padthaway Formation.

Vegetation: Mallee broombush with blue gum.



Type Site: Site No.: SE045

1:50,000 sheet: 6925-1 (Keith)

Hundred: Stirling

Annual rainfall: 500 mm

Sampling date: 08/11/95

Landform: Flat

Surface: Soft with no stones. Water table at 120 cm, EC = 8.48 dS/m.

Soil Description:

| Depth (cm) | Description |
|------------|---|
| 0-10 | Dark grey soft loamy sand. Clear to: |
| 10-28 | Bleached soft sand. Sharp to: |
| 28-50 | Yellowish brown and olive brown mottled firm medium clay with coarse columnar structure, breaking to angular blocky. Clear to: |
| 50-67 | Light brown, olive and red mottled firm medium clay with moderate coarse angular blocky structure. Abrupt to: |
| 67-100 | Pale olive, yellow and red mottled firm medium clay with strong coarse prismatic, breaking to blocky structure. Clear to: |
| 100-122 | Olive grey and yellow brown mottled firm medium clay with 20-50% calcrete fragments and 10-20% soft carbonate segregations. Clear to: |
| 122-130 | Calcrete pan in water table. |



Classification: Supracalcic, Mottled-Subnatric, Brown Sodosol; medium, non-gravelly, sandy/clayey, deep.

Summary of Properties

| | |
|--------------------------------|---|
| Drainage | Imperfectly drained. The sodic clay subsoil causes water to "perch", saturating part of the soil for up to several weeks. |
| Fertility | Natural fertility is low due to the low clay content - this is supported by the low CEC values. Organic matter is the main contributor to nutrient retention in the surface. The data indicate that phosphorus, sulphur, potassium and magnesium are adequately supplied, but calcium may be deficient. Note phosphorus leaching. |
| pH | Neutral at the surface, alkaline with depth. |
| Rooting depth | 100 cm in pit but few roots below 67 cm. |
| Barriers to root growth | |
| Physical: | The sodic clay subsoil prevents roots from proliferating freely. |
| Chemical: | The ground water is marginally saline and will restrict root growth - a potential problem if the water table rises. Salt and boron levels in the soil are not limiting. |
| Water holding capacity | Approximately 90 mm in root zone (moderate). |
| Seedling emergence | Good except where non wetting is a problem. |
| Workability | Good. |
| Erosion Potential | |
| Water: | Low. |
| 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 -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 | 7.6 | 7.1 | 0 | 0.38 | 2.87 | 2.6 | 32 | 138 | 27 | 1.9 | 0.54 | 12 | 4.2 | 2.6 | 8.1 | 4.28 | 3.54 | 0.30 | 0.16 | 3.7 |
| 0-10 | 7.2 | 6.8 | 0 | 0.41 | 2.96 | 1.6 | 32 | 166 | 25 | 0.9 | - | - | - | - | 5.5 | 3.08 | 2.13 | 0.26 | 0.20 | 4.7 |
| 10-28 | 8.0 | 7.5 | 0 | 0.34 | 3.28 | 0.1 | 25 | 83 | 16 | 0.1 | - | - | - | - | 1.2 | 0.55 | 0.44 | 0.04 | 0.05 | na |
| 28-50 | 8.1 | 7.7 | 0.1 | 0.58 | 3.20 | 0.4 | 12 | 592 | 25 | 3.7 | - | - | - | - | 24.4 | 8.85 | 10.73 | 1.71 | 2.04 | 7.0 |
| 50-67 | 8.5 | 8.0 | 1.3 | 0.49 | 2.36 | 0.2 | <4 | 533 | 21 | 2.0 | - | - | - | - | 21.6 | 9.30 | 9.86 | 1.86 | 1.77 | 8.6 |
| 67-100 | 8.7 | 7.7 | 0.1 | 0.30 | 1.72 | 0.1 | <4 | 415 | 24 | 1.5 | - | - | - | - | 19.4 | 8.47 | 6.77 | 2.20 | 1.23 | 11.3 |
| 100-122 | 8.8 | 8.2 | 8.3 | 0.58 | 2.34 | 0.1 | <4 | 492 | 42 | 1.3 | - | - | - | - | 20.3 | 10.83 | 7.07 | 2.67 | 1.38 | 13.2 |

Note: Paddock sample bulked from 20 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.