# SAND OVER SANDY CLAY ON RUBBLE

***General Description:*** *Medium thickness sand over a coarsely structured brown clay on calcrete at shallow depth*

**Landform:** Very gently undulating plain with stony and sandy rises and marginally to highly saline flats.

**Substrate:** Calcreted coarse textured lagoon sediments (Padthaway Formation)

**Vegetation:** Mallee

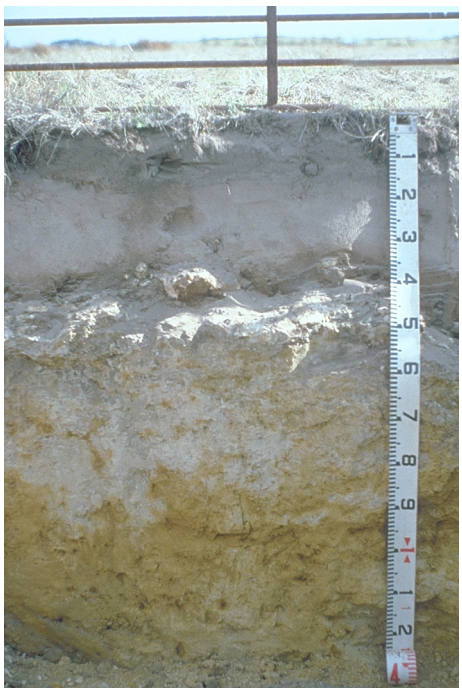
**Type Site:**

| | | | |
|---|---|---|---|
| Site No.: | MM120 | 1:50,000 mapsheet: | 6726-1 (Meningie) |
| Hundred: | Bonney | Easting: | 355510 |
| Section: | 181 | Northing: | 6053330 |
| Sampling date: | 30/05/1994 | Annual rainfall: | 450 mm average |

Flat. Soft surface, no stones.

**Soil Description:**

| *Depth (cm)* | *Description* |
|---|---|
| 0-9 | Very dark greyish brown soft loamy sand. Clear to: |
| 9-15 | Dark brown soft sand. Abrupt to: |
| 15-32 | Brown soft sand. Sharp to: |
| 32-42 | Dark brown friable (moist) sandy clay with coarse columnar structure. Sharp to: |
| 42-55 | Rubbly calcrete. Abrupt to: |
| 55-83 | Light yellowish brown friable massive very highly calcareous light sandy clay loam with 20-50% carbonate nodules (6-20 mm). Clear to: |
| 83-120 | Yellowish brown friable massive very highly calcareous sandy clay loam with 10-20% carbonate nodules (6-20 mm). Gradual to: |
| 120-140 | Brownish yellow friable massive highly calcareous light sandy clay loam. |
| 140- | Watertable. |



**Classification:** Lithocalcic, Subnatric, Brown Sodosol; thick, non-gravelly, sandy / clayey, shallow

## *Summary of Properties*

**Drainage:** Well drained. The soil rarely remains wet for more than a few days.

**Fertility:** Inherent fertility is low, as indicated by the exchangeable cation data. Regular phosphorus applications are essential. Nitrogen levels depend on legume status of pasture. Zinc and copper deficiencies are possible, although levels at the sampling site are adequate. Manganese deficiencies possible in lupins. Organic carbon levels are satisfactory.

**pH:** Neutral at the surface, alkaline with depth.

**Rooting depth:** 83 cm in pit, but few roots below 42 cm.

**Barriers to root growth:**

**Physical:** The rubbly calcrete severely impedes root proliferation.

**Chemical:** High salinity and sodicity below the calcrete effectively prevent deeper root growth.

**Waterholding capacity:** Approximately 40 mm in the rootzone.

**Seedling emergence:** Satisfactory, although affected by water repellence in dry seasons.

**Workability:** Soft surface is easily worked.

**Erosion Potential:**

**Water:** Low.

**Wind:** Moderate.

## *Laboratory Data*

| Depth cm | pH $H_2O$ | pH $CaCl_2$ | $CO_3$ % | EC1:5 dS/m | ECe dS/m | Org.C % | Avail. P mg/kg | Avail. K 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 | 7.0 | 6.8 | <0.1 | 0.07 | 0.84 | 1.0 | 17 | 141 | 0.4 | 0.7 | 15 | 3.7 | 1.6 | 4.3 | 4.1 | 0.5 | 0.10 | 0.31 | 2.3 |
| | | | | | | | | | | | | | | | | | | | |
| 0-9 | 6.8 | 6.6 | 0 | 0.09 | 0.89 | 0.9 | 13 | 95 | 0.4 | 0.4 | 14 | 6.1 | 1.4 | 4.9 | 4.4 | 0.5 | 0.09 | 0.25 | 1.8 |
| 9-15 | 6.0 | 5.7 | 0 | 0.05 | 0.43 | 0.4 | 7 | 85 | 0.2 | 0.3 | 20 | 2.7 | 0.2 | 3.5 | 2.0 | 0.2 | 0.08 | 0.20 | 2.3 |
| 15-32 | 5.6 | 5.2 | 0 | 0.03 | 0.26 | 0.1 | 7 | 70 | 0.1 | 0.2 | 18 | 1.1 | 0.1 | 2.5 | 0.9 | 0.1 | 0.13 | 0.16 | na |
| 32-42 | 7.2 | 6.8 | <0.1 | 0.68 | 5.16 | 0.6 | <4 | 212 | 4.7 | 0.2 | 19 | 0.6 | 0.2 | 15.0 | 8.3 | 4.3 | 2.03 | 0.88 | 13.5 |
| 42-55 | - | - | - | - | - | - | - | - | - | - | | - | - | - | - | - | - | - | - |
| 55-83 | 8.9 | 8.4 | 20.8 | 1.65 | 17.81 | 0.5 | <4 | 89 | 1.9 | 0.1 | 3 | 0.6 | 0.2 | 4.1 | 2.5 | 1.4 | 1.15 | 0.49 | 28.0 |
| 83-120 | 8.9 | 8.3 | 20.7 | 1.46 | 17.73 | 0.1 | <4 | 55 | 0.8 | 0.1 | 2 | 0.5 | 0.2 | 2.8 | 1.4 | 0.8 | 0.49 | 0.16 | na |
| 120-140 | 9.0 | 8.4 | 22.0 | 2.22 | 19.08 | 0.3 | <4 | 85 | 0.7 | 0.12 | 2 | 0.5 | 0.1 | 2.5 | 1.3 | 0.8 | 0.39 | 0.14 | na |

**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