# SANDY LOAM OVER POORLY STRUCTURED BROWN CLAY

***General Description:*** *Medium thickness loamy sand to sandy loam with a compact bleached subsurface layer, overlying a red, brown and yellow mottled tough clay, calcareous with depth*

**Landform:** Gently undulating low rises

**Substrate:** Heavy clay with soft carbonate (lime) accumulations

**Vegetation:** Eucalyptus leucoxylon (blue gum) woodland

**Type Site:** Site No.: SE015

| | | | |
|---|---|---|---|
| 1:50,000 sheet: | 7025-3 (Mundulla) | Hundred: | Wirrega |
| Annual rainfall: | 510 mm | Sampling date: | 17/03/93 |
| Landform: | Lower slope of low rise, 6% slope, adjacent to swampy flat | | |
| Surface: | Firm with no stones | | |

**Soil Description:**

| *Depth (cm)* | *Description* |
|---|---|
| 0-15 | Dark reddish brown massive light sandy loam. Clear to: |
| 15-23 | Pinkish grey massive light sandy loam. Sharp to: |
| 23-45 | Red, brown and orange mottled very firm heavy clay with strong coarse columnar structure. Gradual to: |
| 45-55 | Orange and dark brown mottled firm medium clay with strong coarse prismatic structure. Clear to: |
| 55-85 | Dark brown and pale yellow firm highly calcareous medium clay with strong coarse prismatic structure (Class I carbonate layer). Diffuse to: |
| 85-120 | Pale olive and yellowish brown mottled very firm heavy clay with strong very coarse prismatic structure and soft calcareous segregations. |

**Classification:** Hypercalcic, Mottled-Mesonatric, Brown Sodosol; medium, non-gravelly, loamy/clayey, deep

## *Summary of Properties*

**Drainage** Imperfect due to slowly permeable subsoil. Water lies on top of the clay layer, saturating the lower part of the topsoil for weeks at a time during winter.

**Fertility** Moderately high inherent fertility, as indicated by the CEC value of the subsoil which has a reasonable capacity to store and release major plant nutrients. The light topsoil however has a much lower capacity, with most nutrient storage attributable to the organic matter. At the type site (not a farmed paddock), phosphorus is very low (natural levels), and subsoil zinc is also low.

**pH** Mildly acidic at the surface, becoming strongly alkaline with depth.

**Rooting depth** 55 cm in pit (native grass roots).

**Barriers to root growth**

**Physical:** The tough clay subsoil impedes root development. The bleached subsurface layer when saturated in winter restricts root growth, and forms a physical barrier when it becomes hard and dense on drying in spring time.

**Chemical:** The Class I carbonate layer (from 55 cm) impedes root growth. Subsoil zinc deficiency may also be a problem. Low levels of other nutrients are readily corrected by fertilizer applications.

**Water holding capacity** 75 mm in root zone (moderate), but a portion of this is effectively unavailable due to sub-optimal root densities.

**Seedling emergence** Fair to good depending on the condition of the surface. Reduced organic matter levels will cause the surface to set hard, restricting seedling emergence.

**Workability** Fair to good, depending on organic matter levels. Excessive cultivation or stock trampling will destroy organic matter and induce a hard setting condition.

**Erosion Potential**

**Water:** Moderately low to moderate, depending on the slope. The soil is highly erodible, so even gentle slopes are susceptible.

**Wind:** Moderately low, depending on the degree to which the surface has been pulverized.

## *Laboratory Data*

| Depth cm | pH $H_2O$ | pH $CaC1_2$ | $CO_3$ % | 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 | |
| 0-15 | 6.3 | 6.0 | 0 | 0.08 | 0.54 | 2.2 | 5 | 341 | - | 1.2 | 0.2 | 33 | 3.9 | 0.3 | 10.8 | 8.07 | 1.59 | 0.12 | 0.57 | 7.1 |
| 15-23 | 5.9 | 5.1 | 0 | 0.02 | 0.17 | 0.3 | 3 | 238 | - | 0.4 | 0.1 | 27 | 0.3 | 0.1 | 3.2 | 2.53 | 0.80 | 0.11 | 0.25 | na |
| 23-45 | 6.7 | 5.9 | 0 | 0.11 | 0.46 | 0.7 | <4 | 1026 | - | 3.9 | 0.4 | 28 | 0.6 | 0.1 | 31.1 | 13.1 | 12.2 | 1.79 | 2.73 | 20.9 |
| 45-55 | 8.3 | 7.8 | 1 | 0.39 | 1.36 | 0.5 | <4 | 1290 | - | 7.9 | 0.4 | 11 | 1.7 | 0.1 | 36.8 | 12.7 | 15.3 | 3.06 | 3.14 | 24.8 |
| 55-85 | 8.9 | 8.1 | 27 | 0.42 | 2.17 | 0.4 | <4 | 921 | - | 8.5 | 0.4 | 7 | 0.7 | 0.3 | 23.9 | 7.74 | 11.9 | 2.62 | 1.98 | 25.6 |
| 85-120 | 9.2 | 8.4 | 19 | 0.65 | 2.84 | 0.3 | <4 | 701 | - | 12.1 | 0.3 | 6 | 0.5 | 0.3 | 22.7 | 4.21 | 13.7 | 4.63 | 1.68 | 39.9 |

**Note**: 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.