# SAND OVER COARSELY STRUCTURED BROWN CLAY

***General Description:*** *Thick loose sand to loamy sand with a bleached sub-surface layer, abruptly overlying a coarsely structured brown sandy clay, calcareous with depth*

**Landform:** Very gently undulating plain

**Substrate:** Blanchetown Clay – coarsely structured red and grey clay with pockets of fine carbonate leached in from above.

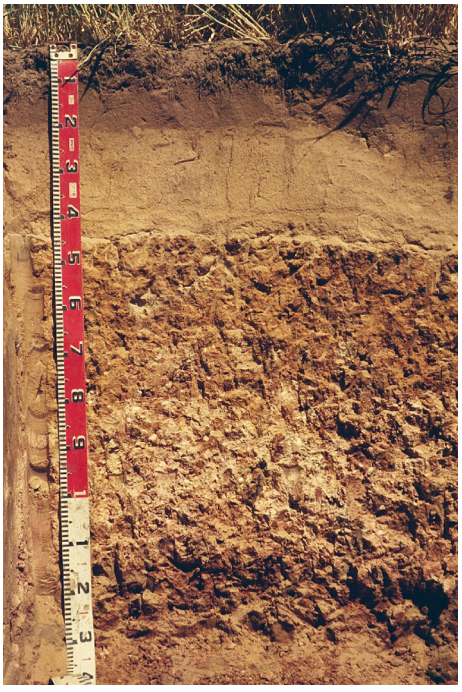
**Vegetation:**

**Type Site:**

| | | | |
|---|---|---|---|
| Site No.: | MM160 | 1:50,000 mapsheet: | 7027-4 (Karte) |
| Hundred: | Parilla | Easting: | 464340 |
| Section: | 83 | Northing: | 6113370 |
| Sampling date: | 15/10/2007 | Annual rainfall: | 325 mm average |

Low rise in very gently undulating dunefield. Loose surface with no stones.

**Soil Description:**



| *Depth (cm)* | *Description* |
|---|---|
| 0-10 | Brown loose single grain light loamy sand. Clear to: |
| 10-20 | Brown soft single grain light loamy sand. Abrupt to: |
| 20-45 | Very pale brown (bleached) single grain light loamy sand. Sharp to: |
| 45-65 | Yellowish brown and strong brown very hard sandy light medium clay with weak very coarse columnar structure. Gradual to: |
| 65-85 | Yellowish red, light yellowish brown and olive yellow mottled very hard, highly calcareous sandy light medium clay with weak coarse prismatic structure and 2-10% fine carbonate segregations. Diffuse to: |
| 85-100 | Red and light olive brown very hard, very highly calcareous light medium clay with moderate coarse angular blocky structure and 20-50% fine carbonate segregations. |
| 100-130 | Red and light brownish grey mottled hard medium clay with coarse prismatic structure and yellow sand between aggregates. |

**Classification:** Bleached-Sodic, Hypercalcic, Brown Chromosol; thick, non-gravelly, sandy/clayey, deep

## *Summary of Properties*

**Drainage:** Moderately well drained. Water perches on top of the clayey subsoil for a week or so at a time following heavy or prolonged rainfall.

**Fertility:** Inherent fertility is low, as indicated by the exchangeable cation data. This is due to the low clay content of the topsoil. Test data indicates deficiencies of sulphur, copper and zinc. Levels of macro nutrients potassium, calcium and magnesium are marginal. Nutrient retention capacity of the bleached subsurface layer is extremely low.

**pH:** Slightly acidic at the surface, strongly alkaline with depth.

**Rooting depth:** A few roots penetrate to 130 cm, but most are in the upper 85 cm.

**Barriers to root growth:**

**Physical:** The subsoil clay impedes root growth, forcing many roots around the large aggregates, rather than growing into them. This results in sub-optimal root density and reduced water uptake.

**Chemical:** Low nutrient status in the subsurface sand restricts root density and is probably the main constraint to productivity. Root growth. In the deep subsoil, very high pH from 85 cm restricts most deeper root growth.

**Waterholding capacity:** Approximately 90 mm (moderately high) in the potential rootzone.

**Seedling emergence:** Potentially patchy in water repellence seasons.

**Workability:** Satisfactory.

**Erosion Potential:**

**Water:** Low.

**Wind:** Moderate to moderately high due to the thick sandy surface soil and slightly exposed position.

## *Laboratory Data*

| Depth cm | pH $H_2O$ | pH $CaCl_2$ | $CO_3$ % | EC 1:5 dS/m | ECe dS/m | Org.C % | Avail. P mg/kg | Avail. K mg/kg | Cl mg/kg | $SO_4$-S mg/kg | Boron mg/kg | Trace Elements mg/kg (EDTA) | | | | Sum cations cmol (+)/kg | Exchangeable Cations cmol(+)/kg | | | | Est. ESP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | Cu | Fe | Mn | Zn | | Ca | Mg | Na | K | |
| 0-10 | 6.6 | 6.2 | 0 | 0.02 | 0.16 | 0.61 | 35 | 94 | 6 | 2.1 | 0.5 | 0.28 | 72 | 8.43 | 1.11 | 2.8 | 2.13 | 0.44 | 0.06 | 0.19 | 2.1 |
| 10-20 | 7.1 | 6.7 | 0 | 0.02 | 0.10 | 0.38 | 21 | 74 | 1 | 1.1 | 0.5 | 0.16 | 77 | 8.80 | 0.49 | 2.6 | 1.97 | 0.47 | 0.05 | 0.13 | 1.9 |
| 20-45 | 7.7 | 7.3 | 0 | 0.02 | 0.21 | 0.21 | 8 | 55 | 2 | 1.0 | 0.3 | 0.10 | 38 | 2.63 | 0.22 | 1.9 | 1.3 | 0.43 | 0.06 | 0.12 | 3.1 |
| 45-65 | 8.9 | 8.2 | 0 | 0.11 | 0.39 | 0.23 | 5 | 225 | 3 | 1.9 | 1.9 | 0.24 | 37 | 1.37 | 0.24 | 16.4 | 7.51 | 7.66 | 0.65 | 0.60 | 4.0 |
| 65-85 | 9.2 | 8.6 | 1.9 | 0.18 | 0.53 | 0.28 | 4 | 285 | 5 | 2.8 | 4.6 | 0.46 | 14 | 1.38 | 0.23 | 23.4 | 9.45 | 11.7 | 1.49 | 0.78 | 6.4 |
| 85-100 | 9.5 | 8.9 | 14.3 | 0.26 | 0.87 | 0.24 | 4 | 283 | 25 | 10.0 | 9.0 | 0.84 | 6 | 1.74 | 0.33 | 26.2 | 9.06 | 13.0 | 3.31 | 0.79 | 12.6 |
| 100-130 | 9.0 | 8.5 | 0.2 | 0.54 | 2.26 | 0.15 | 4 | 289 | 275 | 48.5 | 13.8 | 0.98 | 15 | 2.75 | 0.27 | 25.7 | 2.48 | 14.3 | 8.09 | 0.85 | 31.5 |

**Note**: Sum of cations, in a neutral to alkaline soil, approximates the CEC (cation exchange capacity), 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, in this case estimated by the sum of cations.

**Further information:** DEWNR Soil and Land Program