

## SAND OVER COARSELY STRUCTURED CLAY (Wharminda soil)

**General Description:** *Medium to thick sand over a coarsely structured and dispersive red or brown clay, calcareous with depth*

**Landform:** Very gently undulating plains.

**Substrate:** Tertiary clay.

**Vegetation:**



**Type Site:** Site No.: EE049

1:50,000 sheet: 6130-4 (Kielpa)

Hundred: Smeaton

Annual rainfall: 365 mm

Sampling date: 04/07/88

Landform: Very gently undulating plain

Surface: Soft with no stones

### Soil Description:

| Depth (cm) | Description  |
|------------|--|
| 0-10       | Very dark greyish brown loose fine sand. Abrupt to:                                    |
| 10-17      | Dark greyish brown massive loamy sand. Abrupt to:                                      |
| 17-24      | Brown massive loamy sand. Abrupt to:   |
| 24-35      | Pale brown massive loamy sand with a 5 mm bleached layer at the base. Sharp to:        |
| 35-42      | Yellowish brown massive sandy clay. Abrupt to:   |
| 42-50      | Brownish yellow highly calcareous sandy clay with weak lenticular structure. Clear to: |
| 50-78      | Orange very highly calcareous light clay with weak lenticular structure. Gradual to:   |
| 78-108     | Orange very highly calcareous sandy clay with weak lenticular structure. Gradual to:   |
| 108-130    | Brownish yellow moderately calcareous sandy clay with weak lenticular structure.       |



**Classification:** Calcic, Hypernatric, Brown Sodosol; thick, non-gravelly, sandy / clayey, deep

## Summary of Properties

- Drainage:** Moderately well to imperfectly drained. Water perches on top of clayey subsoil for up to a week and possibly longer, following heavy or prolonged rainfall.
- Fertility:** Inherent fertility is moderately low, as indicated by the exchangeable cation data. Topsoil nutrient retention capacity is poor (low clay content), but subsoil traps leached material. Regular phosphorus applications are essential. Nitrogen levels depend on cropping history and legume status of pastures. Zinc, copper and manganese deficiencies are likely from time to time. Sulphur levels are also likely to be declining, although there are usually ample subsoil reserves.
- pH:** Slightly acidic at the surface, strongly alkaline at depth.
- Rooting depth:** Not recorded. Estimate that most growth occurs in the upper 42 cm, above the clay.
- Barriers to root growth:**
- Physical:** The dense dispersive subsoil clay prevents strong uniform root growth.
  - Chemical:** High pH, sodicity and boron concentrations impede root growth into the clay.
- Water holding capacity:** Approximately 45 mm in the root zone.
- Seedling emergence:** Satisfactory except when water repellence is a problem, usually in drier seasons.
- Workability:** Soft to loose surface is easily worked.
- Erosion Potential**
- Water:** Low.
  - Wind:** Moderate.

## Laboratory Data

| Depth cm | pH H <sub>2</sub> O | pH CaCl <sub>2</sub> | CO <sub>3</sub> % | EC1:5 dS/m | ECe dS/m | Org.C % | Avail. P mg/kg | Avail. K mg/kg | SO <sub>4</sub> -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    |     |
| 0-10     | 6.5                 | 5.7                  | 2                 | 0.09       | 1.21     | -       | -              | -              | -                        | 0.8         | 0.20                        | 11  | 3.00 | 0.76 | 2.6             | ?                               | 0.40 | 0.01 | 0.12 | 1   |
| 10-17    | 6.9                 | 6.1                  | 2                 | 0.08       | 0.82     | -       | -              | -              | -                        | 0.8         | 0.21                        | 10  | 3.61 | 0.22 | 1.9             | ?                               | 0.50 | 0.02 | 0.20 | 1   |
| 17-24    | 7.4                 | 6.6                  | 2                 | 0.07       | 0.65     | -       | -              | -              | -                        | 0.9         | 0.13                        | 6.8 | 1.92 | 0.10 | 2.0             | ?                               | 0.40 | 0.03 | 0.12 | 2   |
| 24-35    | 7.8                 | 7.0                  | 1                 | 0.06       | 0.53     | -       | -              | -              | -                        | 0.7         | 0.07                        | 7.7 | 0.39 | 0.09 | 1.0             | ?                               | 0.30 | 0.02 | 0.06 | 2   |
| 35-42    | 9.4                 | 7.8                  | 2                 | 0.39       | 1.76     | -       | -              | -              | -                        | 11.1        | 0.33                        | 13  | 0.22 | 0.11 | 11.0            | ?                               | 5.10 | 2.90 | 1.20 | 26  |
| 42-50    | 9.6                 | 8.1                  | 3                 | 0.56       | 2.50     | -       | -              | -              | -                        | 19.9        | 0.48                        | 14  | 0.25 | 0.09 | 12.0            | ?                               | 7.30 | 4.20 | 1.50 | 35  |
| 50-78    | 9.8                 | 8.3                  | 9                 | 0.74       | 3.97     | -       | -              | -              | -                        | 28.8        | 0.78                        | 11  | 0.48 | 0.06 | 16.0            | ?                               | 8.30 | 5.80 | 1.90 | 36  |
| 78-108   | 10.0                | 8.4                  | 14                | 0.56       | 2.00     | -       | -              | -              | -                        | 18.5        | 0.61                        | 5.7 | 0.18 | 0.08 | 11.0            | ?                               | 8.10 | 3.30 | 1.30 | 30  |
| 108-130  | 10.0                | 8.3                  | 7                 | 0.57       | 1.60     | -       | -              | -              | -                        | 18.7        | 0.56                        | 6.3 | 0.28 | 0.06 | 14.0            | ?                               | 9.70 | 6.10 | 1.50 | 44  |

**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.

\* Exchangeable calcium (Ca) values not presented because the laboratory procedure used was inappropriate for calcareous samples.