

## SANDY LOAM OVER RED CLAY

**General Description:** *Reddish brown hard sandy to loamy surface soil overlying a well structured dark reddish brown clayey subsoil, calcareous with depth*

**Landform:** Flat to gently sloping alluvial plains and creek flats.

**Substrate:** Gritty sandy clay alluvium derived from nearby hills developed on coarse grained rocks.

**Vegetation:**

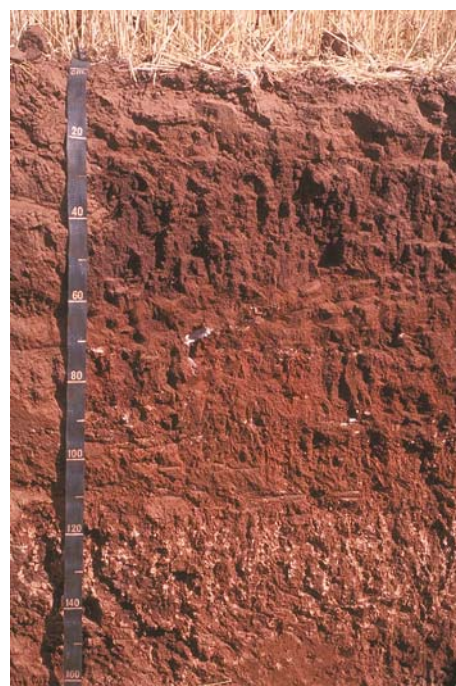


**Type Site:** Site No.: CU001

|                  |  |                |          |
|------------------|--|----------------|----------|
| 1:50,000 sheet:  | 6531-2 (Gladstone)                       | Hundred:       | Narridy  |
| Annual rainfall: | 425 mm                                   | Sampling date: | 21/02/92 |
| Landform:        | Alluvial plain, slope 1%                 |                |          |
| Surface:         | Hard setting with up to 2% quartz gravel |                |          |

### Soil Description:

| <i>Depth (cm)</i> | <i>Description</i>  |
|-------------------|---|
| 0-11              | Dark reddish brown hard massive sandy loam. Abrupt to:  |
| 11-18             | Dark reddish brown hard sandy clay with weak coarse prismatic structure. Abrupt to:                                     |
| 18-44             | Dark reddish brown hard medium heavy clay with strong coarse prismatic structure and slight sandstone gravel. Clear to: |
| 44-100            | Reddish brown firm coarse sandy clay with weak coarse prismatic structure and minor sandstone gravel. Gradual to:       |
| 100-160           | Red firm medium clay, with fine lime (Class I carbonate layer).   |



**Classification:** Sodic, Calcic, Red Chromosol; medium, non-gravelly, loamy / clayey, very deep

## Summary of Properties

|                                |   |
|--------------------------------|---|
| <b>Drainage</b>                | Moderately well. Soil may remain wet for a week.  |
| <b>Fertility</b>               | Soil has high nutrient retention capacity, indicated by the exchangeable cations data. Phosphorus (P) and potassium (K) levels are satisfactory, as are the trace elements copper (Cu), zinc (Zn) and manganese (Mn). Organic carbon, at 0.63% is very low. |
| <b>pH</b>                      | Neutral at surface, grading to alkaline in lower subsoil. The alkalinity is caused by the presence of almost 15% calcium carbonate (CaCO <sub>3</sub> ) at depth and high levels of exchangeable sodium (Na).   |
| <b>Rooting depth</b>           | 150 cm at type site, but not abundant below 44 cm and very few below 100 cm.  |
| <b>Barriers to root growth</b> |   |
| <b>Physical:</b>               | High strength of clay at drier moisture status impedes root growth. Roots are largely restricted to the gaps between the coarse structural aggregates in the clay, and are unable to fully exploit all the moisture inside the aggregates.                  |
| <b>Chemical:</b>               | There is no evidence of salt or toxic elements interfering with root growth. EC values (a measure of salinity) and boron concentrations are low.  |
| <b>Water holding capacity</b>  | 180 mm in rootzone (high), although a significant proportion of this will be effectively unavailable as there are insufficient roots to take up all the water.  |
| <b>Workability</b>             | Fair, due to poor surface structure and narrow moisture range for effective working. Low organic matter needs to be built up to over 1% organic carbon.   |
| <b>Seedling establishment</b>  | Fair to poor, due to poorly structured surface and tendency for sealing. Organic matter reserves should be increased.   |
| <b>Erosion Potential</b>       |   |
| <b>Water:</b>                  | Low due to flatness of land. On sloping ground this soil would be prone to erosion due to its poor surface structure and only moderately permeable subsoil.   |
| <b>Wind:</b>                   | Low.  |

## Laboratory Data

| Depth<br>cm | pH<br>H <sub>2</sub> O | pH<br>CaCl <sub>2</sub> | CO <sub>3</sub><br>% | EC1:5<br>dS/m | ECe<br>dS/m | Org.C<br>% | Avail.<br>P<br>mg/kg | Avail.<br>K<br>mg/kg | SO <sub>4</sub> -S<br>mg/kg | Boron<br>mg/kg | Trace Elements mg/kg<br>(DTPA) |      |      |      | CEC<br>cmol<br>(+)/kg | Exchangeable Cations<br>cmol(+)/kg |      |      |      | ESP  |
|-------------|------------------------|-------------------------|----------------------|---------------|-------------|------------|----------------------|----------------------|-----------------------------|----------------|--------------------------------|------|------|------|-----------------------|------------------------------------|------|------|------|------|
|             |                        |                         |                      |               |             |            |                      |                      |                             |                | Cu                             | Fe   | Mn   | Zn   |                       | Ca                                 | Mg   | Na   | K    |      |
| Paddock     | 6.8                    | 5.8                     | 0.2                  | 0.05          | -           | 0.63       | 31                   | 280                  | -                           | -              | 0.96                           | 15.5 | 25.0 | 0.32 | -                     | -                                  | -    | -    | -    | -    |
| 0-11        | 6.7                    | 5.9                     | 0.0                  | 0.06          | 0.5         | 0.64       | 35                   | 270                  | -                           | -              | 0.88                           | 14.3 | 26.0 | 0.45 | 7.4                   | 3.88                               | 1.11 | 0.08 | 0.63 | 1.1  |
| 11-18       | 7.0                    | 6.0                     | 0.5                  | 0.03          | 0.2         | 0.45       | 12                   | 240                  | -                           | -              | 1.08                           | 8.1  | 12.9 | 0.21 | 13.4                  | 7.73                               | 2.37 | 0.23 | 0.83 | 1.7  |
| 18-44       | 7.7                    | 6.6                     | 1.4                  | 0.05          | 0.2         | 0.52       | 3                    | 230                  | -                           | 2.5            | 0.86                           | 3.0  | 4.5  | 0.05 | 29.6                  | 15.5                               | 5.44 | 0.65 | 1.06 | 2.2  |
| 44-100      | 9.2                    | 7.7                     | 1.4                  | 0.15          | 0.3         | 0.23       | 2                    | 120                  | -                           | 1.7            | 0.67                           | 2.2  | 1.7  | 0.08 | 17.7                  | 9.83                               | 4.27 | 1.63 | 0.52 | 9.2  |
| 100-160     | 9.7                    | 8.3                     | 14.9                 | 0.38          | 0.8         | 0.21       | 1                    | 240                  | -                           | 8.1            | 0.73                           | 2.1  | 0.9  | 0.07 | 24.2                  | 8.02                               | 7.81 | 5.45 | 1.01 | 22.5 |

**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.