# CALCAREOUS CLAY

***General Description:*** *Well structured red calcareous clay becoming more clayey, more coarsely structured, and with slickensides at depth, usually with soft gypsum deep in the profile*

**Landform:** Gently inclined outwash fans below fine grained basement rock highs

**Substrate:** Gypseous clayey alluvium

**Vegetation:** Saltbush, black bluebush and acacia shrubland

**Type Site:**

| | | | |
|---|---|---|---|
| Site No.: | CU057 | 1:50,000 mapsheet: | 6533-3 (Quorn) |
| Hundred: | Palmer | Easting: | 228650 |
| Section: | 120 | Northing: | 6420550 |
| Sampling date: | 17/11/1995 | Annual rainfall: | 280 mm average |

Midslope of a very gently inclined fan, with a firm surface, 10-20% surface quartzite stones and a slope of 2%. Minor quartzite and ironstone gravel throughout profile.

**Soil Description:**

| *Depth (cm)* | *Description* |
|---|---|
| 0-8 | Red highly calcareous light clay with moderate polyhedral structure. Abrupt to: |
| 8-20 | Reddish brown highly calcareous medium clay with strong fine polyhedral structure. Abrupt to: |
| 20-40 | Reddish brown highly calcareous firm medium clay with strong very coarse blocky structure. Diffuse to: |
| 40-70 | Reddish brown highly calcareous firm medium clay with strong very coarse blocky structure and slickensides. Clear to: |
| 70-100 | Red highly calcareous firm medium clay with strong coarse blocky structure and 10-20% soft gypsum. Gradual to: |
| 100-180 | Red highly calcareous firm medium clay with strong fine polyhedral structure, 10-20% crystalline gypsum and 2-10% soft manganese segregations. |

**Classification:** Vertic, Pedal, Calcic Calcarosol; gravelly, clayey / clayey, very deep

## *Summary of Properties*

**Drainage:** Well drained.

**Fertility:** The high CEC value (reflecting high clay content) indicates good nutrient storage potential.

**pH:** Alkaline throughout, but not strongly so.

**Rooting depth:** Good root growth to 70 cm, then only in old root channels to 140 cm.

**Barriers to root growth:**

**Physical:** The hard, large clay aggregates from 20 cm restrict the degree to which roots can exploit moisture reserves within them.

**Chemical:** High subsoil boron levels (from 100 cm), and moderate salinity from 70 cm (although this is mainly due to the gypsum).

**Waterholding capacity:** Approximately 120 mm in rootzone - in most seasons, the potential soil moisture store would not fill.

**Seedling emergence:** Good, except where scalded.

**Erosion Potential:**

**Water:** Moderately low due to low slope and high clay content, but presence of minor scalding indicates that this soil will erode.

**Wind:** Low to moderate - overgrazing will pulverize surface soil leading to wind erosion loss.

## *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 | $SO_4$-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 | |
| Paddock | 7.6 | 6.9 | <0.1 | 0.11 | 0.86 | 0.9 | 14 | 974 | 25 | 1.4 | 1.1 | 7.4 | 15 | 0.76 | 19.5 | 10.70 | 4.20 | 0.27 | 2.97 | 1.4 |
| | | | | | | | | | | | | | | | | | | | | |
| 0-8 | 8.2 | 7.9 | 1.9 | 0.43 | 1.51 | 0.9 | 11 | 874 | 186 | 1.8 | - | - | - | - | 34.5 | 25.14 | 6.98 | 0.33 | 2.88 | 1.0 |
| 8-20 | 8.6 | 8.0 | 2.9 | 0.16 | 0.63 | 0.4 | 7 | 373 | 32 | 2.1 | - | - | - | - | 36.9 | 25.35 | 9.33 | 0.55 | 1.32 | 1.5 |
| 20-40 | 8.9 | 8.1 | 3.2 | 0.25 | 0.80 | 0.3 | 4 | 233 | 30 | 3.6 | - | - | - | - | 35.8 | 23.62 | 9.71 | 2.46 | 0.79 | 6.9 |
| 40-70 | 9.0 | 8.2 | 3.5 | 0.48 | 1.89 | 0.3 | 4 | 231 | 37 | 4.8 | - | - | - | - | 35.4 | 21.74 | 9.50 | 5.04 | 0.75 | 14.2 |
| 70-100 | 8.1 | 8.0 | 3.9 | 3.88 | 6.76 | 0.2 | 11 | 206 | 5304 | 10.3 | - | - | - | - | 34.1 | 24.08 | 9.88 | 6.36 | 0.74 | 18.7 |
| 100-180 | 8.3 | 8.2 | 6.3 | 4.87 | 8.52 | 0.1 | 18 | 229 | 2336 | 39.6 | - | - | - | - | 30.7 | 14.78 | 13.03 | 7.37 | 0.80 | 24.0 |

**Note**: Paddock sample bulked from 20 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