

## GRADATIONAL RED CLAY

**General Description:** *Clay loam to clay grading to a coarsely structured red clay, highly calcareous from shallow depth, overlying clayey sediments*

**Landform:** Gently inclined to flat plains.

**Substrate:** Tertiary clay, mantled by carbonate.

**Vegetation:**



**Type Site:** Site No.: MO027  
 1:50,000 sheet: 6727-4 (Monarto)      Hundred: Monarto  
 Annual rainfall: 360 mm      Sampling date: 1976  
 Landform: Very gently sloping (1%) plain  
 Surface: Firm with minor calcrete stones

**Soil Description:**

| <i>Depth (cm)</i> | <i>Description</i>  |
|-------------------|---|
| 0-7               | Dark reddish brown light clay with weak subangular blocky structure. Clear to:  |
| 7-15              | Dark reddish brown hard medium clay with angular blocky structure and minor quartz and ironstone gravel. Clear to:                  |
| 15-22             | Dark reddish brown hard highly calcareous medium clay with 10-20% fine carbonate segregations. Clear to:                            |
| 22-31             | Brown very highly calcareous clay with pockets of dark reddish brown medium clay. Clear to:   |
| 31-65             | Platy carbonate with pockets of yellowish red highly calcareous sandy clay loam. Gradual to:  |
| 65-85             | Yellowish red massive soft sandy clay with 20-50% fine pink carbonate segregations. Gradual to:                                     |
| 85-140            | Yellowish red, olive and dusky red hard heavy clay with strong prismatic structure and 10-20% fine carbonate decreasing with depth. |



**Classification:** Sodic, Hypercalcic, Red Dermosol; thin, non-gravelly, clayey / clayey, moderate

## Summary of Properties

**Drainage:** Moderately well to imperfectly drained. The clayey texture restricts permeability and the soil may remain saturated for a week to several weeks following prolonged or heavy rainfall.

**Fertility:** Inherent fertility is high, as indicated by the high clay content at the surface and the exchangeable cation data. Nitrogen and phosphorus deficiencies are usual, and the high pH may induce deficiencies of zinc, copper and manganese.

**pH:** Alkaline at the surface, strongly alkaline with depth

**Rooting depth:** Not recorded. Estimate 65 cm in pit, but root density below 30 cm is likely to be low.

### Barriers to root growth:

**Physical:** The dense subsoil layers of clay and carbonate restrict root growth to some extent.

**Chemical:** High pH and likely high boron levels limit root growth.

**Water holding capacity:** Approximately 70 mm in the root zone.

**Seedling emergence:** Fair to satisfactory, depending on the condition of the surface. Low organic matter levels may lead to sealing of surface, reducing establishment percentages.

**Workability:** Fair. Clayey surface likely to become sticky and intractable when wet.

### Erosion Potential

**Water:** Low.

**Wind:** Low.

## Laboratory Data

| Depth<br>cm | Coarse<br>sand<br>% | Fine<br>sand<br>% | Silt<br>% | Clay<br>% | pH<br>H <sub>2</sub> O | CO <sub>3</sub><br>% | EC 1:5<br>dS/m | Cl<br>mg/kg | CEC<br>cmol<br>(+)/kg | Exchangeable Cations<br>cmol(+)/kg |     |      |      | ESP  |
|-------------|---------------------|-------------------|-----------|-----------|------------------------|----------------------|----------------|-------------|-----------------------|------------------------------------|-----|------|------|------|
|             |                     |                   |           |           |                        |                      |                |             |                       | Ca                                 | Mg  | Na   | K    |      |
| 0-7         | 31                  | 27                | 4         | 34        | 8.3                    | 0.4                  | 0.10           | <50         | 27                    | 19.9                               | 2.3 | 0.63 | 2.3  | 2.3  |
| 7-15        | 25                  | 27                | 4         | 40        | 8.4                    | 0.3                  | 0.09           | <50         | 26                    | 21.4                               | 2.6 | 0.69 | 2.1  | 2.7  |
| 22-31       | 20                  | 20                | 6         | 24        | 8.8                    | 27                   | 0.10           | <50         | 21                    | 18.9                               | 3.5 | 0.88 | 0.85 | 4.2  |
| 65-85       | 22                  | 14                | 2         | 21        | 9.8                    | 34                   | 0.53           | 200         | 15                    | 5.9                                | 6.6 | 3.4  | 1.0  | 22.7 |
| 105-125     | 34                  | 19                | 5         | 30        | 9.8                    | 10                   | 0.56           | 314         | 21                    | 4.8                                | 9.4 | 5.1  | 1.3  | 24.3 |

**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.