# CLAY LOAM OVER RED CLAY

***General Description:*** *Thick reddish brown massive clay loam overlying a dark reddish brown strongly structured clay, calcareous with depth*

**Landform:** Flats and lower slopes

**Substrate:** Fine grained alluvium with variable soft carbonate segregations (Pooraka Formation)

**Vegetation:** Blue gum / peppermint box woodland

**Type Site:**

| | | | |
|---|---|---|---|
| Site No.: | CM014B | 1:50,000 mapsheet: | 6629-1 (Riverton) |
| Hundred: | Waterloo | Easting: | 305150 |
| Section: | 1010 | Northing: | 6231850 |
| Sampling date: | 14/02/92 | Annual rainfall: | 500 mm average |

Valley flat between undulating rises. Hard setting surface. 0% slope. CM014A is on a poor stand of lucerne. CM014B (2 metres away) is on a healthy stand. From the results and observations, it is not possible to determine the cause of the poor growth. Possible reasons include a) pesticide residues, b) surface compaction, and c) impeded drainage.

**Soil Description: CM014B (healthy lucerne)**

| *Depth (cm)* | *Description* |
|---|---|
| 0-10 | Dark brown fine sandy clay loam with moderate granular structure. Clear to: |
| 10-15 | Reddish brown clay loam with moderate platy structure. Clear to: |
| 15-35 | Yellowish red massive clay loam. Abrupt to: |
| 35-85 | Red heavy clay with strong angular blocky structure. Gradual to: |
| 85-120 | Brown highly calcareous medium clay with strong coarse angular blocky structure and minor soft carbonate segregations. Gradual to: |
| 120-150 | Red highly calcareous medium clay with strong polyhedral structure. |

**Classification:** Haplic, Calcic, Red Chromosol; thick, non-gravelly, clay loamy/clayey, very deep

## *Summary of Properties*

**Drainage:** Moderately well to imperfectly drained. The subsoil clay layer restricts free movement of water and the soil may remain wet for a week or so at a time.

**Fertility:** The soil has a moderately high inherent fertility, although the surface soil relies on adequate organic matter content for satisfactory nutrient retention.

**pH:** Acidic at the surface, alkaline with depth.

**Rooting depth:** Few roots below 85 cm under poor lucerne (CM014A). This contrasts with the roots from the healthy plants (CM014B) extending beyond 150 cm.

**Barriers to root growth:**

**Physical:** No apparent barriers.

**Chemical:** No apparent barriers.

**Waterholding capacity:** Approximately 110 mm in rootzone of CM014A. More than 180 mm in upper 150 cm (CM014B).

**Seedling emergence:** Fair, due to hard setting, sealing surface.

**Workability:** Fair. The soil has a narrow moisture range for effective working due to its high fine sand and moderate clay content.

**Erosion Potential:**

**Water:** Low.

**Wind:** Low.

## *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 | Ext Al mg/kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Cu | Fe | Mn | Zn | | Ca | Mg | Na | K | | |
| Paddock | 5.9 | 5.0 | 0 | 0.07 | 0.7 | 1.49 | 46 | 330 | - | - | 1.08 | 47.9 | 39.7 | 0.60 | 8.0 | 5.37 | 0.96 | 0.8 | 0.93 | 1.0 | 0.4 |
| | | | | | | | | | | | | | | | | | | | | | |
| 0-10 | 6.1 | 5.3 | 0 | 0.10 | 0.9 | 1.58 | 46 | 340 | - | - | 1.14 | 42.8 | 51.4 | 0.60 | 8.2 | 6.05 | 1.00 | 0.10 | 1.12 | 1.2 | 0.4 |
| 10-15 | 5.6 | 4.7 | 0 | 0.06 | 0.6 | 0.94 | 11 | 210 | - | - | 1.11 | 42.1 | 59.2 | 0.15 | 7.5 | 5.04 | 0.98 | 0.11 | 0.54 | 1.5 | 0.5 |
| 15-35 | 6.5 | 5.4 | 0 | 0.02 | 0.1 | 0.63 | 6 | 140 | - | - | 1.18 | 19.2 | 32.0 | 0.07 | 7.6 | 5.55 | 1.24 | 0.16 | 0.42 | 2.1 | - |

**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.

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