

BLACK CLAY

General Description: *Black calcareous clay with strong fine granular structure, becoming more clayey, more calcareous, more coarsely structured and greyer coloured with depth*

Landform: Flat plains.

Substrate: Lagoonal clays, marls and limestones of the Padthaway Formation.

Vegetation: Red gum (*E.camaldulensis*) woodland.



| | | | | |
|-------------------|--|-----------|--------------------|-----------------|
| Type Site: | Site No.: | SE133 | 1:50,000 mapsheet: | 7023-1 (Struan) |
| | Hundred: | Robertson | Easting: | 478700 |
| | Section: | 348 | Northing: | 5895720 |
| | Sampling date: | 20/09/07 | Annual rainfall: | 595 mm average |
| | Level plain. Firm surface with no stones | | | |

Soil Description:

| <i>Depth (cm)</i> | <i>Description</i> | |
|-------------------|---|--|
| 0-10 | Black friable moderately calcareous light clay with strong fine granular structure. Gradual to: | |
| 10-23 | Black friable highly calcareous light medium clay with moderate to strong fine polyhedral structure and minor carbonate nodules. Gradual to: | |
| 23-50 | Very dark grey very highly calcareous firm light medium clay with moderate fine polyhedral structure and 20-50% soft and nodular carbonate segregations. Gradual to: | |
| 50-70 | Very dark grey very highly calcareous firm light medium clay with moderate fine polyhedral structure and about 50% soft and nodular carbonate segregations. Gradual to: | |
| 70-100 | As above, but clay is highly calcareous. Gradual to: | |
| 100-120 | As above, but with grey and brown mottles. Clear to: | |
| 120-150 | Fractured carbonate pan with 10% pockets of grey and yellow mottled firm light medium clay with moderate subangular blocky structure. Gradual to: | |
| 150-170 | Fractured carbonate pan with 10% pockets of grey and yellow mottled coarsely structured light clay. | |

Classification: Melanic, Pedal, Lithocalcic Calcarosol; medium, non-gravelly, clayey / clayey, deep



Summary of Properties

- Drainage:** Imperfectly drained. The high clay content and flat terrain cause water to saturate the soils for several weeks at a time following heavy or prolonged rainfall.
- Fertility:** Inherent fertility is very high, as indicated by the exchangeable cation data. However, the moderately high carbonate content to the surface causes reduced availability of several elements including phosphorus, manganese, zinc and copper. Levels of all of these except zinc appear to be marginal from the test data. High organic carbon levels reflect the relatively undisturbed condition of this soil.
- pH:** Alkaline at the surface, strongly alkaline in the subsoil, grading to alkaline in the deep subsoil.
- Rooting depth:** There are some roots to 150 cm, but most growth is in the upper 120 cm.
- Barriers to root growth:**
- Physical:** The carbonate pan from 120 restricts deep root growth, with most occurring through fractures.
 - Chemical:** High pH from 50 cm, and moderate salinity and sodicity from 100 cm and 70 cm respectively constrain root growth, but don't prevent it.
- Waterholding capacity:** Approximately 140 mm in the rootzone
- Seedling emergence:** Satisfactory.
- Workability:** Moderate. Surface becomes very sticky when wet.
- Erosion Potential:**
- Water:** Low.
 - Wind:** Low.

Laboratory Data

| Depth cm | pH H ₂ O | pH CaCl ₂ | CO ₃ % | EC 1:5 dS/m | ECe dS/m | Org.C % | Avail. P mg/kg | Avail. K mg/kg | Cl mg/kg | SO ₄ -S mg/kg | Boron mg/kg | Trace Elements mg/kg (EDTA) | | | | Sum cations cmol (+)/kg | Exchangeable Cations cmol(+)/kg | | | | Est. ESP |
|-------------|------------------------|-------------------------|----------------------|----------------|-------------|------------|----------------------|----------------------|-------------|-----------------------------|----------------|--------------------------------|----|------|------|----------------------------------|------------------------------------|------|------|------|-------------|
| | | | | | | | | | | | | Cu | Fe | Mn | Zn | | Ca | Mg | Na | K | |
| 0-10 | 8.3 | 7.9 | 6.7 | 0.17 | 0.63 | 4.83 | 13 | 672 | 27 | 7.2 | 2.5 | 0.80 | 14 | 7.26 | 2.12 | 42.3 | 32.8 | 7.32 | 0.30 | 1.82 | 0.7 |
| 10-23 | 8.8 | 8.1 | 12.6 | 0.15 | 0.59 | 3.46 | 7 | 555 | 9 | 5.5 | 4.2 | 0.75 | 18 | 5.61 | 0.71 | 40.1 | 28.1 | 10.1 | 0.37 | 1.56 | 0.9 |
| 23-50 | 9.2 | 8.3 | 40.3 | 0.16 | 0.51 | 1.50 | 5 | 580 | 12 | 6.0 | 7.8 | 0.48 | 11 | 1.77 | 0.39 | 29.4 | 16.2 | 11.0 | 0.61 | 1.60 | 2.1 |
| 50-70 | 9.4 | 8.6 | 44.3 | 0.32 | 0.96 | 1.21 | 5 | 483 | 25 | 5.5 | 6.5 | 0.43 | 10 | 1.76 | 0.33 | 29.0 | 13.2 | 10.5 | 3.94 | 1.42 | 13.6 |
| 70-100 | 9.3 | 8.6 | 40.7 | 0.45 | 2.59 | 1.14 | 5 | 446 | 223 | 21 | 4.6 | 0.52 | 12 | 2.65 | 0.36 | 29.5 | 12.2 | 9.84 | 6.16 | 1.33 | 20.9 |
| 100-120 | 9.1 | 8.4 | 40.7 | 0.67 | 4.47 | 0.41 | 5 | 260 | 637 | 42.8 | 2.1 | 0.38 | 11 | 9.84 | 0.36 | 27.0 | 11.5 | 8.88 | 5.44 | 1.14 | 20.2 |
| 120-150 | 8.9 | 8.3 | 40.0 | 0.80 | 4.25 | 0.19 | 5 | 405 | 773 | 14.3 | 1.6 | 0.35 | 15 | 6.10 | 0.32 | 30.4 | 12.9 | 10.6 | 5.77 | 1.13 | 19.0 |
| 150-170 | 8.8 | 8.3 | 44.0 | 0.87 | 3.69 | 0.13 | 4 | 348 | 805 | 70 | 1.0 | 0.41 | 17 | 8.36 | 0.33 | 32.2 | 14.6 | 11.1 | 5.54 | 1.00 | 17.2 |

Note: Sum of cations, in a neutral to alkaline soil, approximates the CEC (cation exchange capacity), 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, in this case estimated by the sum of cations.

Further information: [DEWNR Soil and Land Program](#)

