

SHALLOW GRADATIONAL LOAM ON CALCRETED LIMESTONE

General Description: *Dark reddish brown, well-structured loam grading to light clay on Mt Gambier Limestone with calcrete and chert*

Subgroup soil: B4

Landform: Undulating plain

Substrate: Miocene limestone

Vegetation: Grass, broadleaf weeds and clover.



| | | | | |
|-------------------|----------------|------------|--------------------|-----------------|
| Type Site: | Site No: | SE148 | 1:50,000 mapsheet: | 7022-3 (Schank) |
| | Hundred: | MacDonnell | Easting: | 471930 |
| | Section: | 265 | Northing: | 5792540 |
| | Sampling date: | 23/10/08 | Annual rainfall: | 745 mm average |

The site is on a slight rise. Note that small water-filled ponds occur nearby.

Soil Description:

| Depth (cm) | Description |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0–10 | Hardsetting, dark reddish brown, loam with fine moderate granular structure. |
| 10–23 | Dark reddish brown, clay loam with fine moderate granular structure and 10–20% hard carbonate fragments (20–60 mm in diameter). |
| 23–41 | Dark reddish brown, light clay with fine moderate granular structure and >50% hard carbonate laminae and fragments (>60 mm in diameter); which equates to a moderately cemented laminar calcrete pan with some pockets of soil. |
| 41–58 | Very weak rock: fine-grained Mt Gambier limestone. |
| 58–65 | Strongly cemented laminar calcrete with pockets of dark reddish brown light clay with massive structure. |
| 65–140 | Very weak rock with 10–20% strong, cobbly chert 'segregations': fine-grained Mt Gambier limestone. |



Classification: Haplic, Petrocalcic, Brown Dermosol; medium, non-gravelly, loamy/clayey, very shallow.

Alternatively: Submelanic, Petrocalcic, Leptic Tenosol; medium, non-gravelly, loamy/clayey, very shallow.



Summary of Properties

- Drainage:** Drainage is imperfect. This is exacerbated by somewhat compacted soil.
- Fertility:** Inherent fertility is high, given the high organic content and relatively high clay content of the soil. Surface soil phosphorus level is very high (above what is required for optimal growth). Boron levels may be marginal for high levels of productivity.
- pH:** Soil pH is slightly alkaline throughout.
- Rooting depth:** Root growth to the base of the soil: 41 cm in the pit where the profile was described.
- Barriers to Root Growth:**
- Physical:** The soil naturally has very good structure; however, some compaction has occurred: root growth would be restricted to some extent due to this. The limestone base forms an obvious barrier to root growth.
- Chemical:** There are no chemical barriers to root growth in the soil.
- Waterholding capacity:** Moderately low. However mild climate reduces the loss of soil moisture to evaporation. Total available: approx 45 mm [(0.1x180)+(0.13x210x0.7)+(0.18x190x0.2)].
- Seedling emergence:** Moderate.
- Workability:** Moderate to good.
- 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 | Al CaCl ₂ 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 | Al | H | |
| Paddock | 7.9 | 7.3 | 0.9 | 0.18 | 1.19 | 5.1 | 131 | 522 | 28 | 15.0 | 1.4 | 0 | 3.0 | 272 | 30 | 7.0 | 16.1 | 13.2 | 1.7 | 0.2 | 0.9 | 0.0 | 0.0 | 1 |
| 0-10 | 7.6 | 7.0 | 0.3 | 0.17 | 1.25 | 4.5 | 126 | 359 | 28 | 15.1 | 1.2 | 0 | 3.5 | 450 | 58 | 7.9 | 17.3 | 14.0 | 2.2 | 0.3 | 0.7 | 0.0 | 0.0 | 2 |
| 10-23 | 7.9 | 7.3 | 0.2 | 0.07 | 0.45 | 1.9 | 25 | 186 | 9 | 6.2 | 0.9 | 0 | 0.7 | 261 | 17 | 0.9 | 11.9 | 9.2 | 1.9 | 0.3 | 0.4 | 0.0 | 0.0 | 3 |
| 23-41 | 7.8 | 7.3 | 0.4 | 0.20 | 0.92 | 1.6 | 8 | 255 | 29 | 23.7 | 1.5 | 0 | 0.6 | 76 | 129 | 0.5 | 24.1 | 19.2 | 3.6 | 0.5 | 0.8 | 0.0 | 0.0 | 2 |
| 41-58 | | | | | | | | | | | | | | | | | | | | | | | | |
| 58-65 | | | | | | | | | | | | | | | | | | | | | | | | |
| 65-140 | 8.8 | 7.8 | 2.6 | 0.15 | 0.99 | 0.1 | 3 | 73 | 94 | 11.2 | 0.3 | 0 | 0.5 | 5.8 | 8.3 | 0.4 | 25.1 | 23.4 | 0.8 | 0.6 | 0.1 | 0.1 | 0.1 | 3 |

Note: Paddock sample bulked from 20 cores (0-10 cm) taken around the pit.

Sum of cations 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](#)

