

LOAM OVER BROWN CLAY

General Description: *Medium thickness dark loam over a coarsely structured brown, black and red mottled clay, calcareous with depth, grading to variable alluvium*

Landform: Old alluvial plains of the lower reaches of the Bremer River.

Substrate: Coarse textured alluvium overlying older Tertiary age sediments.

Vegetation:



| | | | | |
|-------------------|----------------|----------|------------------|----------------------|
| Type Site: | Site No.: | CH135 | 1:50,000 sheet: | 6727-3 (Alexandrina) |
| | Hundred: | Bremer | Easting: | 320405 |
| | Section: | 2832 | Northing: | 6082440 |
| | Sampling date: | 06/12/04 | Annual rainfall: | 380 mm |

Flat plain. Firm surface with no stones. Water table at 190 cm.

Soil Description:

| <i>Depth (cm)</i> | <i>Description</i> |
|-------------------|--|
| 0-15 | Very dark grey firm loam with moderate granular structure. Abrupt to: |
| 15-33 | Brown, with dark reddish brown ped coatings, hard medium clay with strong coarse prismatic structure, breaking to fine angular blocky. Clear to: |
| 33-70 | Reddish brown, with dark reddish brown ped coatings, hard highly calcareous medium clay with 20-50% fine carbonate segregations. Gradual to: |
| 70-105 | Yellowish brown and brown mottled firm massive slightly calcareous sandy light clay. Gradual to: |
| 105-130 | Light olive brown and brownish yellow mottled friable massive alluvial clayey sand. Gradual to: |
| 130-145 | Greyish brown and dark yellowish brown mottled firm medium clay with strong coarse angular blocky structure (Tertiary deposit). Gradual to: |
| 145-190 | Greyish brown, yellowish brown and dark brown mottled friable fine sandy light clay with moderate coarse angular blocky structure. |



Classification: Hypercalcic, Subnatric, Brown Sodosol; medium, non-gravelly, loamy / clayey, deep

Summary of Properties

- Drainage:** Moderately well drained. The upper subsoil may remain wet for up to a week following heavy or prolonged rainfall. Deep drainage is somewhat impeded by the clayey layer at 130 cm and the water table at 190 cm.
- Fertility:** Inherent fertility is moderately high, as indicated by the exchangeable cation data. All layers have high nutrient retention capacity. As the sampling site is outside the planted area, low concentrations are recorded for some nutrient elements, viz. phosphorus, zinc and copper.
- pH:** Alkaline at the surface, strongly alkaline in the subsoil, and less alkaline in the older sediments below the soil profile.
- Rooting depth:** 130 cm in pit, but few roots below 70 cm.
- Barriers to root growth:**
- Physical:** The clayey subsoil and deep subsoil present a minor barrier to root growth, mainly by restricting even proliferation.
- Chemical:** High pH, sodicity and boron levels from 33 cm impede root growth. High salinity from 70 cm defines the effective root zone.
- Water holding capacity:** (Estimates for potential root zone of grape vines)
- Total available: 95 mm
Readily available: 40 mm
- Seedling emergence:** Good to fair, depending on condition of surface soil. Over-cultivation or excessive traffic cause surface to set hard, restricting establishment.
- Workability:** Fair. The soil tends to shatter if worked too dry, and puddle if worked too 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 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 | |
| 0-15 | 8.4 | 7.6 | 0 | 0.243 | 2.15 | 1.55 | 28 | 636 | 133 | 6.2 | 3.2 | 2.65 | 82 | 152 | 1.42 | 17.9 | 8.24 | 6.61 | 1.39 | 1.68 | 7.8 |
| 15-33 | 9.1 | 8.2 | 0 | 0.267 | 1.30 | 0.60 | 5 | 455 | 98 | 17.9 | 6.5 | 3.39 | 51 | 102 | 0.23 | 21.9 | 7.50 | 10.2 | 2.92 | 1.27 | 13.3 |
| 33-70 | 9.5 | 8.5 | 19.3 | 0.435 | 1.85 | 0.21 | 4 | 495 | 242 | 34.8 | 10.1 | 0.90 | 8.0 | 14.1 | 0.11 | 20.2 | 6.59 | 7.03 | 5.36 | 1.24 | 26.5 |
| 70-105 | 9.4 | 8.4 | 1.2 | 0.700 | 8.26 | 0.13 | 2 | 367 | 1131 | 140.0 | 7.4 | 1.84 | 26 | 111 | 0.32 | 18.3 | 4.57 | 4.68 | 8.14 | 0.93 | 44.4 |
| 105-130 | 8.6 | 8.0 | 0 | 1.116 | 11.95 | 0.07 | 2 | 205 | 1342 | 197.0 | 2.8 | 0.84 | 19 | 237 | 0.43 | 10.5 | 1.39 | 2.78 | 5.90 | 0.46 | 56.0 |
| 130-145 | 8.1 | 7.7 | 0 | 2.189 | 11.82 | 0.15 | 2 | 379 | 2186 | 348.0 | 3.2 | 2.09 | 24 | 147 | 0.18 | 19.2 | 2.76 | 5.35 | 10.2 | 0.89 | 53.1 |
| 145-190 | 7.9 | 7.6 | 0 | 1.991 | 18.69 | 0.16 | 3 | 379 | 2540 | 413.0 | 2.6 | 2.51 | 28 | 308 | 0.60 | 20.0 | 2.95 | 5.66 | 10.5 | 0.89 | 52.4 |

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.