

LOAM OVER RED CLAY (STONY)

General Description: *Hard setting red brown loam to clay loam overlying a well structured reddish clay subsoil, calcareous with depth, grading to fine grained alluvium*

Landform: Gently sloping outwash fans, and level flats and plains

Substrate: Fine grained, although often gravelly, alluvium (Pooraka Formation)

Vegetation: Blue gum - red gum woodland



Type Site: Site No.: CH068

| | | | |
|------------------|--|----------------|----------|
| 1:50,000 sheet: | 6627-3 (Willunga) | Hundred: | Willunga |
| Annual rainfall: | 625 mm | Sampling date: | 26/05/94 |
| Landform: | Upper slope of a gently sloping alluvial fan, 4% slope | | |
| Surface: | Firm with 2-10% slate and quartzite stones | | |

Soil Description:

| Depth (cm) | Description |
|------------|---|
| 0-15 | Dark brown silty clay loam with granular structure and 2-10% slate gravel. Clear to: |
| 15-35 | Brown weakly structured silty clay loam with 20-50% fine slate and quartz gravel. Clear to: |
| 35-55 | Reddish brown light clay with weak polyhedral structure and 2-10% slate gravel. Clear to: |
| 55-75 | Red light medium clay with moderate polyhedral structure and 2-10% slate gravel. Gradual to: |
| 75-105 | Dark red medium clay with coarse prismatic structure. Gradual to: |
| 105-160 | Red and brown mottled medium clay with moderate prismatic structure. Gradual to: |
| 160-200 | Reddish brown and brown mottled heavy clay with very coarse structure and 2-10% fine carbonate. |



Classification: Sodic, Eutrophic, Red Dermosol; medium, slightly gravelly, clay loamy/clayey, very deep.

Summary of Properties

| | |
|--------------------------------|--|
| Drainage | Well drained. The soil is unlikely to remain wet for more than a few days. Lateral drainage through the gravel layers is a possibility. Excessive irrigation could cause waterlogging on the heavy clay at depth. |
| Fertility | The inherent fertility is moderate to high, as indicated by the CEC values. Phosphorus, calcium, magnesium, potassium and the trace elements are all adequate by agricultural standards. Organic carbon, and therefore total nitrogen, is high. |
| pH | Slightly alkaline at the surface, becoming slightly acidic with depth and then alkaline in the deep subsoil. |
| Rooting depth | 160 cm in sampling pit (in old tree line). |
| Barriers to root growth | |
| Physical: | There are no physical barriers above the tough clay at 160 cm. |
| Chemical: | Salinity levels are elevated presumably as a result of past irrigation. Note the much higher levels in the present tree line compared with the pit. Soil salt levels should be no more than 0.25 dS/m (1:5 soil:water) in a clay loam soil. Exchangeable sodium is also high, probably for the same reason. These high values may restrict root growth through adverse effects on soil structure and nutrient balance. |
| Water holding capacity | Approximately 200 mm in the root zone. Readily available water capacity in potential rootzone (i.e. 160 cm) for irrigated crops is about 90 mm. |
| Workability | Fair to good, provided that organic matter levels are maintained to keep surface structure in good condition. |
| Erosion Potential | Moderately low potential for water erosion due to the 4% slope. This is easily controlled by maintaining surface cover. |

Laboratory Chemical Data

| Depth cm | pH H ₂ O | pH CaCl ₂ | CaCO ₃ % | EC1:5 dS/m | ECe dS/m | Org.C % | Avail. P mg/kg | Avail. K mg/kg | Boron mg/kg | Trace Elements mg/kg (DTPA) | | | | CEC cmol (+)/kg | Exchangeable Cations cmol(+)/kg | | | | ESP |
|-------------|------------------------|-------------------------|------------------------|---------------|-------------|------------|----------------------|----------------------|----------------|--------------------------------|------|------|-------|-----------------------|------------------------------------|-----|------|------|------|
| | | | | | | | | | | Cu | Fe | Mn | Zn | | Ca | Mg | Na | K | |
| | | | | | | | | | | | | | | | | | | | |
| Row | 7.7 | 7.5 | 0 | 0.67 | 5.74 | 2.3 | 77 | 338 | 2.3 | 25.2 | 15 | 25.5 | 9.9 | 12.3 | 8.0 | 3.1 | 0.68 | 0.72 | 5.5 |
| | | | | | | | | | | *61.6 | *152 | *329 | *17.5 | | | | | | |
| 0-15 | 7.7 | 7.4 | 0 | 0.22 | 1.90 | 2.5 | 28 | 317 | 2.2 | 36.7 | 11 | 18.6 | 8.2 | 13.0 | 8.6 | 3.2 | 0.33 | 0.65 | 2.5 |
| 15-35 | 7.6 | 6.7 | 0 | 0.10 | 1.62 | 0.8 | 14 | 133 | 0.7 | 1.9 | 9 | 8.2 | 0.6 | 8.8 | 4.7 | 1.5 | 1.71 | 0.20 | 19.4 |
| 35-55 | 7.0 | 6.0 | 0 | 0.11 | 1.39 | 0.4 | <4 | 108 | 0.8 | 1.3 | 8 | 7.7 | 0.2 | 8.4 | 4.6 | 1.4 | 2.34 | 0.24 | 27.9 |
| 55-75 | 6.3 | 5.4 | 0 | 0.12 | 1.17 | 0.4 | 4 | 104 | 0.9 | 1.5 | 7 | 7.0 | 0.3 | 9.3 | 4.5 | 1.8 | 2.01 | 0.27 | 21.6 |
| 75-105 | 6.2 | 5.7 | 0 | 0.23 | 1.68 | 0.4 | <4 | 152 | 1.9 | 1.1 | 6 | 5.0 | 0.1 | 11.3 | 5.6 | 4.2 | 1.70 | 0.50 | 15.0 |
| 105-160 | 6.8 | 6.3 | 0 | 0.22 | 1.80 | 0.3 | <4 | 199 | 2.2 | 1.3 | 8 | 8.4 | 0.2 | 17.5 | 8.4 | 5.9 | 1.63 | 0.69 | 9.3 |
| 160-200 | 8.3 | 7.9 | 2.1 | 0.29 | 1.33 | 0.2 | <4 | 203 | 1.9 | 0.7 | 10 | 3.4 | 0.2 | 27.8 | 16.2 | 7.7 | 1.71 | 0.73 | 6.1 |

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

* EDTA trace element analyses for "row" sample.

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.