# HARD GRADATIONAL RED CLAY LOAM
(scalded variant)

***General Description:*** *Sandy loam to clay loam (partly or completely eroded in the scalded variant) overlying a very firm red coarsely structured clay subsoil forming in quartzite or quartzitic siltstone*

**Landform:** Slopes of undulating to rolling low hills

**Substrate:** Quartzite or quartzitic siltstone to fine sandstone

**Vegetation:**

**Type Site:** Site No.: CU038

| | | | |
|---|---|---|---|
| 1:50,000 sheet: | 6532-2 (Booleroo) | Hundred: | Pekina |
| Annual rainfall: | 380 mm | Sampling date: | 06/06/94 |
| Landform: | Upper slope (4% gradient) of an undulating rise | | |
| Surface: | Scalded, with 2-10% quartz stones | | |

**Soil Description:**

| *Depth (cm)* | *Description* |
|---|---|
| 0-8 | Reddish brown light clay with weak coarse subangular blocky structure. Abrupt to: |
| 8-20 | Reddish brown weakly dispersive medium heavy clay with strong polyhedral structure and 2-10% siltstone fragments. Clear to: |
| 20-40 | Yellowish red highly calcareous medium clay with strong polyhedral structure and 20-50% siltstone fragments. Clear to: |
| 40-60 | Weathering siltstone with highly calcareous yellowish red polyhedral structured clay in cleavages and gaps between rock fragments. Diffuse to: |
| 60-120 | Weathering siltstone with minor soft carbonate segregations. |

**Classification:** Sodic, Calcic, Red Dermosol; thin, non-gravelly, clayey / clayey, moderate

## *Summary of Properties*

**Drainage** The soil is moderately well drained. The dispersive clay prevents the free movement of water causing the soil to remain wet for periods of a week or so at a time after rain.

**Fertility** The soil has a moderate level of natural fertility. Because of the high salinity levels and consequent lack of plant growth, nutrient levels are high.

**pH** Alkaline throughout.

**Rooting depth** 40 cm in pit, but there are few roots below 20 cm.

**Barriers to root growth**

**Physical:** High soil strength causes some restrictions to root growth.

**Chemical:** High salinity (2-5 times maximum barley tolerance) is the main limitation. High sodicity (ESP more than 30%) may cause a secondary barrier.

**Water holding capacity** Approximately 70 mm, but not all is available due to poor root densities in the lower part of the profile.

**Seedling emergence** Fair to poor due to saline and sodic surface soil and its tendency to seal.

**Workability** Fair. The poor surface structure and tendency to become wet and sticky limit cultivation opportunities.

**Erosion Potential**

**Water:** Moderate.

**Wind:** Low.

## *Laboratory Data*

| Depth cm | pH $H_2O$ | pH $CaC1_2$ | $CO_3$ % | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Cu | Fe | Mn | Zn | | Ca | Mg | Na | K | |
| Paddock | 8.5 | 8.1 | 3.7 | 2.39 | 16.3 | 1.4 | 61 | 264 | - | 10.4 | 1.6 | 3 | 7.5 | 5.0 | 11.4 | 7.2 | 3.6 | 2.48 | 0.56 | 21.8 |
| | | | | | | | | | | | | | | | | | | | | |
| 0-8 | 8.2 | 8.0 | 0.2 | 6.42 | 38.5 | 1.2 | 112 | 256 | - | 11.6 | 1.1 | 3 | 7.5 | 4.1 | 13.2 | 5.5 | 4.5 | 3.97 | 0.55 | 30.1 |
| 8-20 | 8.4 | 8.1 | 0.2 | 2.94 | 16.6 | 0.6 | 9 | 194 | - | 10.4 | 1.1 | 2 | 3.3 | 0.5 | 14.9 | 3.7 | 5.2 | 5.01 | 0.42 | 33.6 |
| 20-40 | 8.9 | 8.5 | 11.8 | 2.50 | 12.8 | 0.5 | 4 | 81 | - | 6.7 | 2.7 | 1 | 0.5 | 0.3 | 7.7 | 2.7 | 3.6 | 3.11 | 0.19 | 40.4 |
| 40-60 | 8.9 | 8.4 | 7.4 | 2.13 | 12.7 | <0.1 | <4 | 64 | - | 4.8 | 0.3 | 1 | 0.4 | 0.3 | 6.2 | 2.0 | 2.8 | 2.09 | 0.10 | 33.7 |
| 60-120 | 8.6 | 8.4 | 0.3 | 4.15 | 26.0 | <0.1 | <4 | 50 | - | 3.1 | 0.2 | 1 | 0.1 | 0.4 | 5.2 | 1.6 | 2.5 | 2.02 | 0.08 | 38.9 |

**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.