

SO8: Calcic, Mottled-Mesonatric, Grey Sodosol

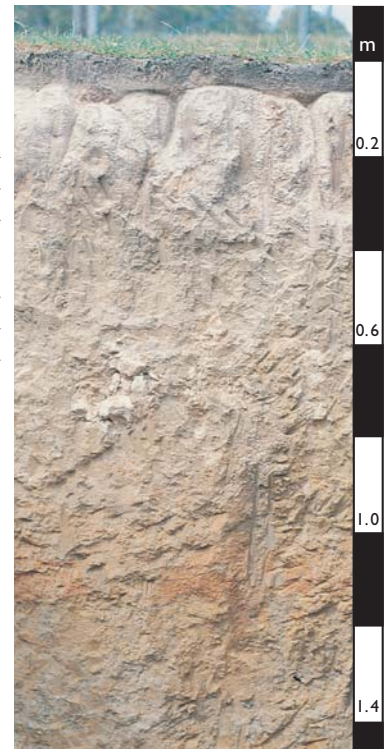
General description of the soil

A texture-contrast soil which is sodic in the upper 0.2 m of the grey, mottled, clayey B2 horizon. A few (2–10%) carbonate nodules occur in the lower B2 horizon (i.e. Calcic).

| | |
|------------------------------|--|
| Distribution: | A very common soil throughout most of the Sodosol regions of Figure 6.13. |
| Typical land use: | Dryland cropping (particularly oats) and grazing. |
| Common variants: | A horizon thickness may range up to 0.25 m and the degree of A2 bleaching also varies. The degree of sodicity and amount of carbonate may differ between profiles. |
| World Reference Base: | Salic Solonetz. |
| Other names: | Solodised Solonetz and Solodic Soils. |

Environment and location of the example profile

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|--------------------------------------|--|
| Landform: | Plain. |
| Parent material or substrate: | Alluvial sediments. |
| Drainage class: | Poorly drained. |
| Surface condition: | Soft. |
| Site disturbance: | Cultivated. |
| Native vegetation: | Salmon Gum (<i>Eucalyptus salmonophloia</i>) woodland. |

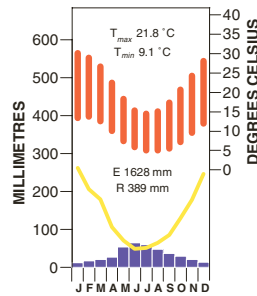


Katanning district, south-west Western Australia

Site location



Site climate



Soil morphology

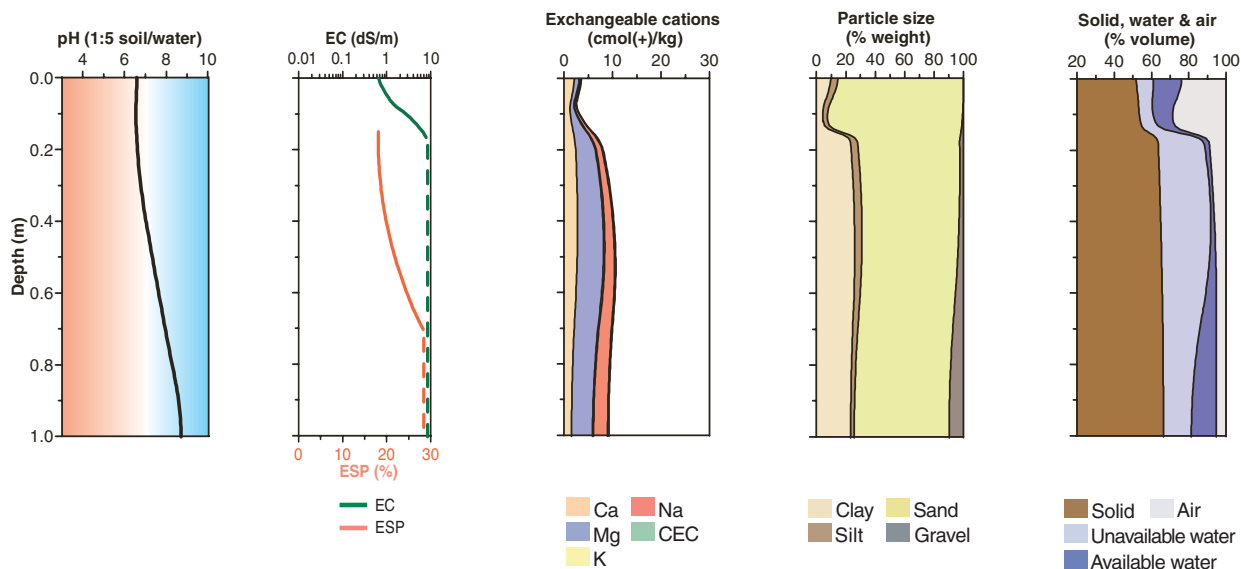
| Horizon | Depth (m) | Colour | Mottles | Texture | Structure | | | Consistence | Coarse fragments | Segregations | Boundary |
|---------|-----------|--------------------------------|-----------------------|-------------------|---|-------|------|-------------------|------------------|-------------------------|----------|
| | | | | | Grade | Shape | Size | | | | |
| A1 | 0–0.03 | dark greyish brown (10YR 4/2) | – | sand | single grain | – | – | weak (dry) | – | – | abrupt |
| A2e | 0.03–0.05 | light brownish grey (10YR 6/2) | – | clayey sand | massive | – | – | weak (dry) | – | – | sharp |
| B21 | 0.05–0.30 | light brownish grey (10YR 6/2) | 20–50% brown distinct | sandy light clay | columnar coated with white bleached clayey sand | – | – | very firm (moist) | – | – | gradual |
| B22 | 0.30–0.60 | light grey (10YR 6/1) | – | sandy light clay | – | – | – | firm (moist) | – | – | gradual |
| B23 | 0.60–0.90 | yellow | 20–50% grey distinct | light medium clay | – | – | – | – | – | 2–10% carbonate nodules | clear |
| BC | 0.90–1.25 | yellowish brown | 10–20% grey | light medium clay | – | – | – | – | – | – | – |

Soil chemical and physical properties

| Horizon | Sample Depth (m) | pH H ₂ O ^A | pH CaCl ₂ ^B | Elect. Cond. dS/m ^A | CaCO ₃ % | Org. C % ^A | Extr. P mg/kg ^A | Tot. P % ^D | Tot. K % | Cation exchange properties ^D cmol(+)/kg | | | | | | ESP % ^A | Bulk dens. Mg/m ³ | Particle size % ^B | | | | |
|---------|------------------|----------------------------------|-----------------------------------|--------------------------------|---------------------|-----------------------|----------------------------|-----------------------|----------|--|------------------|------------------|------------------|------|-----------------|--------------------|------------------------------|------------------------------|----|----|------|------|
| | | | | | | | | | | Ca | Mg | K | Na | H+Al | CEC | | | ECEC | CS | FS | Silt | Clay |
| A1 | 0.0–0.06 | 6.6 | 5.4 | 0.04 | | 0.9 | 3 | 0.005 | | 2.4 | 1.1 | 0.2 | 0.2 | | 4 | | – | | 70 | 16 | 5 | 9 |
| A2 | 0.06–0.15 | 6.4 | 5.5 | 0.04 | | 0.2 | < 2 | 0.002 | | 0.6 | 0.1 | < 0.1 | 0.2 | | 1 | | – | | 68 | 27 | 3 | 2 |
| B1 | 0.15–0.40 | 6.6 | 6.2 | 15 | | | 2 | | | | | | | | | | | | | | | |
| B2 | 0.40–0.65 | 7.4 | 7.0 | 17 | | | < 2 | | | 3.3 ^G | 6.3 ^B | 0.3 ^B | 1.8 ^B | | 10 ^G | | 18 | | 59 | 9 | 5 | 27 |
| B3 | 0.65–0.85 | 8.1 | 7.7 | 12 | | | 2 | | | | | | | | | | | | | | | |
| B3 | 0.85–1.00 | 8.9 | 8.3 | 14 | | | 2 | | | 1.4 ^G | 4.2 ^G | 0.2 ^G | 3.0 ^G | | 9 ^G | | 33 | | 52 | 19 | 3 | 26 |

Note: Laboratory data for a similar soil (McArthur 1991).

Key profile properties



General qualities of the soil

| | |
|-----------------------------------|---|
| Infiltration: | Rapid unless water-repellent. |
| Available water store: | Small to very small and controlled primarily by the depth of the A horizon. |
| Permeability: | Low to very low. |
| Physical root limitations: | Dense, sodic clay subsoils may inhibit root development – restricted aeration in the A2 and B horizons. |
| Erosion hazard: | Sandy surface soils are subject to wind erosion and dispersive subsoils are prone to gully erosion. |
| Nutrient availability: | Poor due to shallow, sandy surface soil. |
| Toxicities: | Surface soil may develop strong acidity. Extreme salinity in the B horizon. |



Water harvesting near Katanning, south-west Western Australia

Acknowledgements: Soil image and soil description: Agriculture Western Australia. Laboratory data for a similar soil from McArthur (1991), Site KTG 10. Landscape image: Richard Woldendorp.