

## SO4: Calcic, Subnatric, Red Sodosol

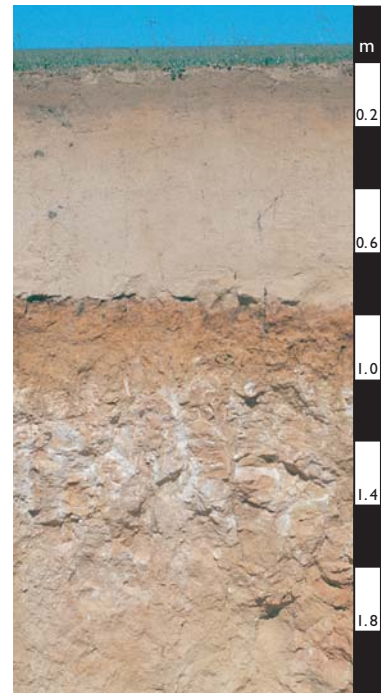
### General description of the soil

A texture-contrast soil which is moderately sodic and not strongly acid in the upper 0.2 m of the red clayey B horizon. The soil has a calcareous horizon in the subsoil (i.e. Calcic).

<b>Distribution:</b>	A common soil in the semi-arid Mallee Region of South Australia and Victoria. There are lesser occurrences in the other mainland states.
<b>Typical land use:</b>	Dryland cropping and grazing.
<b>Common variants:</b>	The A2 horizon may be conspicuously bleached on top of the columnar structure in the B2 horizon. A horizon thickness and depth to clay are variable.
<b>World Reference Base:</b>	Arenic Luvisol.
<b>Other names:</b>	Solodised Solonetz, Solodic Soils, and (sodic) Red-Brown Earths.

### Environment and location of the example profile

<b>Landform:</b>	Gently undulating plain.
<b>Parent material or substrate:</b>	Tertiary sand, mantled by aeolian carbonates.
<b>Drainage class:</b>	Moderately well-drained.
<b>Surface condition:</b>	Loose.
<b>Site disturbance:</b>	Cultivated.
<b>Native vegetation:</b>	Mallee woodland.

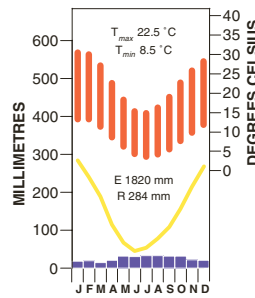


Pinaroo district, south-eastern South Australia

### Site location



### Site climate



### Soil morphology

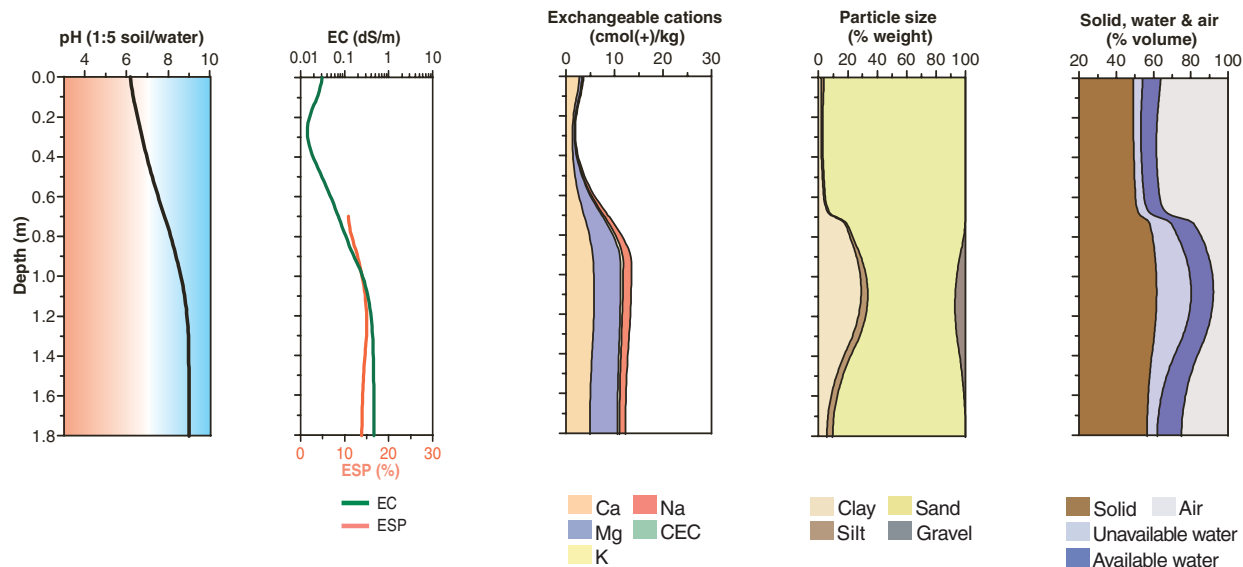
Horizon	Depth (m)	Colour	Mottles	Texture	Structure			Consistence	Coarse fragments	Segregations	Boundary
					Grade	Shape	Size				
A1p	0.00–0.12	reddish brown (5YR 4/4)	–	sand	single grain	–	–	loose (dry)	–	–	abrupt
A21	0.12–0.25	brown (7.5YR 4/4)	–	sand	single grain	–	–	loose (dry)	–	–	gradual
A22	0.25–0.70	brown (7.5YR 5/4)	–	sand	single grain	–	–	very weak (dry)	–	–	sharp
B21t	0.70–0.85	yellowish red (5YR 4/6)	–	sandy clay loam	moderate	columnar	100–200 mm	very firm (moderately moist)	–	–	gradual
B22t	0.85–0.95	yellowish red (5YR 5/8)	light yellowish brown (10YR 6/4)	sandy light clay	weak	prismatic	20–50 mm	very firm (moist)	–	slightly calcareous*	gradual
B3k	0.95–1.35	yellowish red (5YR 5/6)	yellowish brown (10YR 5/6)	light sandy clay loam	weak	angular blocky	20–50 mm	very firm (moist)	2–10% ferricrete (20–60 mm)	20–50% soft carbonate, very highly calcareous*	diffuse
2Ck	1.35–1.80	strong brown (7.5YR 5/6)	yellowish brown (10YR 5/6)	clayey sand	massive	–	–	–	–	slightly calcareous*	

\* Fine earth fraction

### Soil chemical and physical properties

Horizon	Sample Depth (m)	pH H <sub>2</sub> O <sup>A</sup>	pH CaCl <sub>2</sub> <sup>B</sup>	Elect. Cond. dS/m <sup>A</sup>	CaCO <sub>3</sub> % <sup>B</sup>	Org. C % <sup>D</sup>	Extr. P mg/kg <sup>A</sup>	Tot. P %	Tot. K %	Cation exchange properties <sup>C</sup> cmol(+)/kg						ESP % <sup>A</sup>	Bulk dens. Mg/m <sup>3</sup>	Particle size % <sup>A</sup>			
										Ca	Mg	K	Na	H+Al	CEC			ECEC	CS	FS	Silt
A1p	0.00–0.12	6.2	5.9	0.03	< 0.1	0.6	3			2.7 <sup>E</sup>	0.5 <sup>E</sup>	0.2 <sup>E</sup>	0.1 <sup>E</sup>		3 <sup>E</sup>		–	58	38	1	2
A21	0.12–0.25	6.5	6.1	0.01	0.4	0.1	2			1.0 <sup>E</sup>	0.3 <sup>E</sup>	0.1 <sup>E</sup>	0.1 <sup>E</sup>		1 <sup>E</sup>		–				
A22	0.25–0.70	7.1	6.1	0.01	< 0.1	0.1	2			0.8 <sup>E</sup>	0.3 <sup>E</sup>	0.1 <sup>E</sup>	0.1 <sup>E</sup>		1 <sup>E</sup>		–				
B21t	0.70–0.85	8.1	6.5	0.08	0.2	0.2	1			4.9	5.2	0.5	1.2		11		11	39	38	1	22
B22t	0.85–0.95	8.4	6.9	0.12	0.4	0.2	2			5.9	6.3	0.6	1.9		14		13				
B3k	0.95–1.35	9.0	8.0	0.43	3.0	0.2	2			6.0	5.3	0.4	1.8		11		16				
2Ck	1.35–1.80	9.0	7.9	0.47	< 0.1	0.1	2			4.9	5.7	0.4	1.2		9		14				

Key profile properties



General qualities of the soil

<b>Infiltration:</b>	Rapid unless water-repellent.
<b>Available water store:</b>	Small to moderate.
<b>Permeability:</b>	High in the A horizon but slow to very slow in the B horizon.
<b>Physical root limitations:</b>	B horizon strength may be a limitation.
<b>Erosion hazard:</b>	Moderate to high when exposed. Susceptible to wind erosion, particularly under bare fallow-cropping.
<b>Nutrient availability:</b>	This soil generally has a low nutrient status for agriculture. Phosphorus is deficient and regular fertilising is required. Copper and zinc are marginal and nitrogen content will vary depending on the legume content of pastures.
<b>Toxicities:</b>	Medium to high salinity below 1 m.



Aerial view of the mallee landscape in the Pinaroo district, South Australia

Acknowledgements: Soil image, soil description and laboratory data: Department of Water, Land and Biodiversity Conservation, South Australia. Site MM002 from McCord (1995). Landscape image: MapLand, South Australia.