CA4: Epihypersodic, Regolithic, Lithocalcic Calcarosol

General description of the soil

A Lithocalcic Calcarosol (>50% hard carbonate) underlain by structured calcareous clays. An ESP of 15 or greater occurs within the upper 0.5 m of the profile.

Distribution:	These soils occur widely in the agricultural districts of south-eastern South Australia, particularly the Eastern Eyre Peninsula, Murray Mallee, Murray Plains, Northern Agricultural Districts, and Yorke Peninsula.
Typical land use:	Cereal cropping and annual pastures grazed by sheep.
Common variants:	Variation occurs in the amount, form and distribution of the carbonate seggregations.
World Reference Base:	Luvic Calcisol.
Other names:	Solonised Brown Soils and Mallee Soils.

Environment and location of the example profile

Landform:	Plain
Parent material or substrate:	Substrate consists of structured calcareous clays.
Drainage class:	Well-drained. Soil is never saturated for more than a few days.
Surface condition:	Firm.
Site disturbance:	Cultivation.
Native vegetation:	Mallee shrubland.

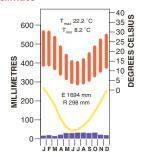
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High levels of exchangeable sodium and calrete rubble dominate, near Pinaroo, South Australia

Site location



Site climate



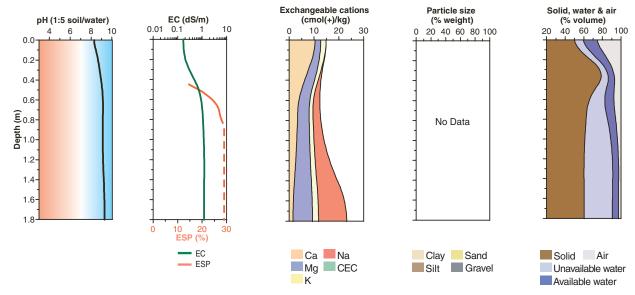
Soil morphology

Horizon	Depth	Colour	Mottles	Texture		Structure		Consistence	Coarse	Segregations	Boundary
	(m)		Grade Shape Size			fragments					
A1p	0.00-0.09	dark brown (7.5YR 3/2)	-	sandy loam	massive	-	-		-	<2% carbonate nodules (2–6 mm) highly calcareous*	abrupt
B2tk	0.09-0.20	dark brown (10YR 3/3)	-	light sandy clay loam	massive	-	-		-	<2% carbonate nodules 2–6 mm) very highly calcareous*	clear
B2k	0.20-0.45	brown (10YR 5/3)	-	sandy clay loam	massive	-	-		-	>50% carbonate nodules (2–6 mm) very highly calcareous*	diffuse
Ck	0.45-0.72	pink (7.5YR 7/4)	-	light clay	massive	-	_		-	2–10% carbonate nodules (2–6 mm) very highly calcareous*	diffuse
2C1k	0.72–1.00	strong brown (7.5YR 5/6)	-	medium clay	weak	prismatic	20–50 mm		-	highly calcareous*	diffuse
2C2k	1.00–1.40	yellowish red (5YR 5/6)	light brownish grey (10YR 6/2)	medium clay	moderate	prismatic	20–50 mm		-	moderately calcareous*	diffuse
2C	1.40–1.80	yellowish red (5YR 4/8)	light brownish grey (10YR 6/2)	heavy clay	strong	prismatic	20–50 mm		-		

Soil chemical and physical properties

Horizon	Sample Depth	pH H₂O ^A	pH CaCl ₂ B	Elect. Cond.	CaCO ₃	Org. C % ^D	Extr. P	Tot. P %	Tot. K %		Catio		change mol(+)	prope /kg	rties ^G		ESP % ^A	Bulk dens.	ا	Partio	:le siz %	ze
	(m)			dS/m ^A			mg/kg ^A			Ca	Mg	K	Na	H+Al	CEC	ECEC		Mg/m³	CS	FS	Silt	Clay
A1p	0.00-0.09	8.3	7.3	0.17	2	2.0	210			10.5	2.3	2.2	<0.1		11		-					
B2tk	0.09-0.20	8.6	7.5	0.16	5	0.9	110			10.2	2.4	2.2	<0.1		11		-					
B2k	0.20-0.45	8.9	7.9	0.21	25	0.6	21			7.2	4.0	1.4	0.2		12		-					
Ck	0.45-0.72	9.2	8.2	1.00	47	0.3	4			3.2	4.4	1.5	2.9		10		28					
2C1k	0.72-1.00	9.1	8.2	1.22	36	0.1	< 2			3.0	5.3	1.8	4.0		13		32					
2C	1.40–1.80	9.3	8.2	1.19	5	0.1	< 2			1.5	7.9	2.4	11.4		17		67					

Key profile properties



General qualities of the soil

Infiltration:	Rapid.
Available water store:	Moderate in the root zone for crops 0 – 0.72 m in the example profile.
Permeability:	High to moderate in the deeper layers.
Physical root limitations:	Calcrete rubble may restrict downward movement of roots.
Erosion hazard:	Low to moderate when exposed but dependent on soil texture and landform
Nutrient availability:	Regular phosphorus fertiliser is essential. Nitrogen levels will depend on the legume content of pastures and cropping intensity. Copper and zinc are marginal.
Toxicities:	Often high to very high salinity at depth.



Crops in spring transform the semi–arid landscape near Pinaroo, South Australia

Acknowledgements: Soil image, soil description and laboratory data: Department of Water, Land and Biodiversity Conservation, South Australia. Site MM036 from McCord (1995). Landscape image: Peter Fisher, Southlight Photo Agency.