CA10: Epihypersodic, Petrocalcic, Calcic Calcarosol

General description of the soil A Calcic Calcarosol (2–20% soft and < 20% hard carbonate) underlain by a hard calcrete pan. An ESP of 15 or greater occurs within the upper 0.5 m of the profile.

Distribution:	A common soil in the Southern Mallee Region of South Australia and adjacent Victoria.
Typical land use:	Cereal cropping and annual pastures grazed by sheep.
Common variants:	Depth to hard calcrete is variable and it may occur as a continuous pan.
World Reference Base:	Epipetric Calcisol.
Other names:	Solonised Brown Soils, Mallee Soils and Grey-Brown and Red Calcareous Soils.

Environment and location of the example profile

Landform:	Crest of low rise.
Parent material or substrate:	Calcrete overlying sediments.
Drainage class:	Well-drained. Soil never remains saturated for more than a few days.
Surface condition:	Firm.
Site disturbance:	Cultivation.
Native vegetation:	Tall mallee shrubland.



A sodic profile with abundant calcrete, 55 km north-east of Murray Bridge, South Australia



Soil morphology

Site location

Horizon	Depth Colour		Mottles	Texture		Structure		Consistence	Coarse	Segregations	Boundary
	(m)				Grade	Shape	Size		fragments		
Ар	0.00-0.09	dark brown (7.5YR 3/2)	-	light sandy loam	single grain	-	-		-	10–20% carbonate nodules (20–60 mm)	abrupt
Bk	0.09–0.18	brown (7.5YR 4/2)	-	light sandy clay loam	weak	subangular blocky	20–50 mm		-	10–20% carbonate nodules (20–60 mm) highly calcareous*	abrupt
2Bkm	0.18–0.81	brown (7.5YR 5/4)	-	sandy clay loam	massive	-	-		strongly cemented nodular calcrete pan	>90% carbonate nodules (>60 mm) very highly calcareous*	diffuse
Ck	0.81–1.70	light brown (7.5YR 7/4)	-	sandy clay loam	massive	-	-		-	>50% carbonate nodules (2–6 mm) very highly calcareous*	
* Fine ear	th fraction			•		•			<u> </u>	•	

Soil chemical and physical properties

Horizon	Sample Depth	рН Н ₂ О ^А	pH CaCl ₂ ^B	Elect. Cond.	CaCO ₃ % ^B	Org. C % ^D	Extr. P	Tot. P %	Tot. K %	Cation exchange properties ^G cmol(+)/kg					ESP % ^A	Bulk dens.	Particle size %					
	(m)			dS/m ^A			mg/kg ^A			Ca	Mg	К	Na	H+Al	CEC	ECEC		Mg/m³	CS	FS	Silt	Clay
Ар	0.00-0.09	7.8	7.2	0.07	2	0.1	26			6.0	1.1	0.6	0.1		7		-					
Bk	0.09–0.18	8.6	7.9	0.14	3	0.1	12			7.3	1.1	0.5	0.1		8		-					
2Bkm	0.18-0.81	9.4	8.5	0.74	52	< 0.1	5			4.0	2.9	0.2	1.7		7		24					
Ck	0.81-1.20	9.5	8.6	1.74	70	0.1	2			1.0	2.2	0.6	3.1		6		53					
Ck	1.20-1.70	9.8	8.5	1.08	61	< 0.1	3			0.7	3.3	1.1	4.8		10		46					

Calcarosols

Key profile properties



General qualities of the soil

Infiltration:	Rapid.
Available water store:	Small to very small. Crops are frequently stressed in spring.
Permeability:	Moderate and probably low to very low in the deeper layers.
Physical root limitations:	Restricted by stone and boulder calcrete.
Erosion hazard:	Low.
Nutrient availability:	Low phosphorus (fertiliser essential) and nitrogen (depends on pasture legume). Copper and zinc are marginal.
Toxicities:	Possibly boron. High salinity below 0.2 m increasing to extreme with depth.



Calcrete boulders and stones gathered from the landsurface to allow cereal cropping, near Murray Bridge, South Australia

Acknowledgements: Soil image, soil description and laboratory data: Department of Water, Land and Biodiversity Conservation, South Australia. Site MM011 from McCord (1995). Landscape image: Department of Water, Land and Biodiversity Conservation, South Australia.