

## TE1: Melanic-Calcareous, Andic, Chernic Tenosol

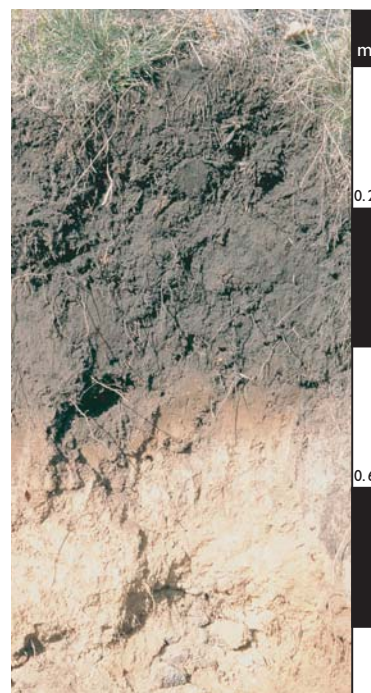
### General description of the soil

The Chernic Tenosols are characterised by organic or dark A1 horizons and usually a weakly developed (tenic) B horizon. The Andic great group indicates a soil usually formed from basaltic tephra which contains significant amounts of volcanic glass and minerals such as allophane.

<b>Distribution:</b>	These soils are formed on the youngest volcanoes in Australia (4000–5000 years) and their known occurrence is so far restricted to the Mt Gambier district of south-eastern South Australia. Other 'Andic' type soils may occur on some older volcanic landscapes in Western Victoria.
<b>Typical land use:</b>	Reserved land and improved pasture.
<b>Common variants:</b>	Soil texture may vary from loamy sand to sandy loam as well as silty loam. Carbonate is variable, ranging up to 35% in the fine earth and may form Bk horizons. Basaltic glass in the sand fraction may exceed 50%.
<b>World Reference Base:</b>	Chernic Chernozem.
<b>Other names:</b>	These soils at Mt Gambier have also been referred to as Chernozems (Stace et al. 1968, p. 132).

### Environment and location of the example profile

<b>Landform:</b>	Crater floor at the base of the steep crater walls.
<b>Substrate:</b>	Basaltic lava spatter and tephra.
<b>Drainage class:</b>	Well-drained.
<b>Surface condition:</b>	Soft.
<b>Site disturbance:</b>	Partly cleared.
<b>Native vegetation:</b>	Open woodland.

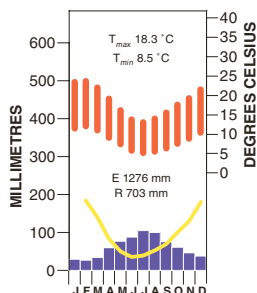


Mt Gambier, south-east South Australia

### Site location



### Site climate



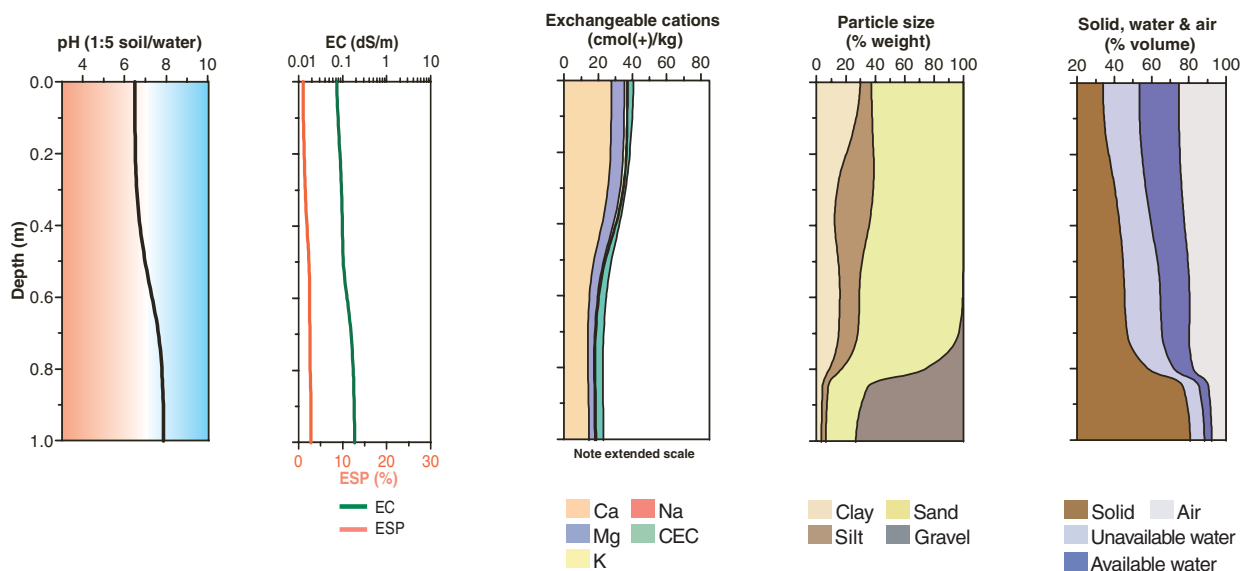
### Soil morphology

Horizon	Depth (m)	Colour	Mottles	Texture	Structure			Consistence	Coarse fragments	Segregations	Boundary
					Grade	Shape	Size				
A11	0–0.20	black (10YR 2/1)	–	silty loam	moderate	very fine granular	2–5 mm	weak (moist)	sparse gravel stones	–	gradual
A12	0.20–0.35	black (10YR 2/1)	–	silty loam	moderate	very fine granular	2–5 mm	weak (moist)	becoming gravelly and stony towards the base	–	distinct wavy
A/B	0.35–0.45	very dark brown (10YR 2/2)	<2% yellowish red (5YR 4/8)	gravelly silt loam				weak (moist)	–	–	distinct
Bw1	0.45–0.60	brown (7.5YR 5/4)	2–10% yellowish red (5YR 4/8)	gritty clay loam	weak	blocky		friable and slightly plastic	–	–	distinct
Bw2	0.60–0.80	brown (7.5YR 4/4)	–	sandy clay loam	weak	subangular blocky		firm (moist)	–	–	sharp irregular
Bsm	0.80–0.82	dark reddish brown (5YR 3/3) and brown (10YR 4/4)	–	cemented coarse sand and fine gravel particles	strongly cemented	ironpan (much ferrihydrite)			–	–	distinct irregular
Ck	0.82+	mainly black		gravelly and stony vesicular basaltic tephra	–	–	–			white CaCO <sub>3</sub> coatings under clasts	friable Bw material fills interstices of upper few cm of basalt

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	Tot. P %	Tot. K %	Cation exchange properties <sup>E</sup> cmol(+)/kg						ESP % <sup>A</sup>	Bulk dens. Mg/m <sup>3</sup>	Particle size % <sup>K</sup>					
										Ca	Mg	K	Na	H+Al	CEC			ECEC	CS	FS	Silt	Clay	
A11	0.00–0.20	6.5	6.1	0.08		5.6					27.7	7.5	1.7	0.4		40		1		54	8	11	27
A12	0.20–0.35	6.5	6.0	0.10		6.7					27.2	7.5	1.8	0.6		37		1		50	8	28	10
Bw1	0.45–0.60	7.0	6.6	0.09		1.2					14.5	5.4	0.2	0.7		25		3		62	8	12	16
Bw2	0.60–0.80	7.8	7.5	0.17	6	1.2					12.9 <sup>C</sup>	3.6 <sup>B</sup>	0.2 <sup>B</sup>	0.6 <sup>B</sup>		22 <sup>C</sup>		3		57	9	13	15
Bsm	0.80–0.82					1.1														85	0	9	8
Ck	0.82 +	7.9	7.6	0.19	19	1.4					14.7 <sup>C</sup>	3.3	0.2	0.7		23 <sup>C</sup>		3		55	5	9	10

Key profile properties



General qualities of the soil

Infiltration:	Rapid.
Available water store:	Moderate. Total water store limited by depth but large storage per unit depth.
Permeability:	High above the pan.
Physical root limitations:	None above the iron pan and good aeration in the solum.
Erosion hazard:	Low.
Nutrient availability:	Good.
Toxicities:	None apparent.



The youngest volcanic craters in Australia occur near Mt Gambier, South Australia. Blue Lake is in the foreground and Brownes Lake beyond – the soil is from the crater floor of Brownes Lake.

Acknowledgements: Soil image: CSIRO Land and Water. Soil profile description and laboratory data from Lowe (1992), Site 3, Brownes Lake. Landscape image: South Australian Tourism Commission.