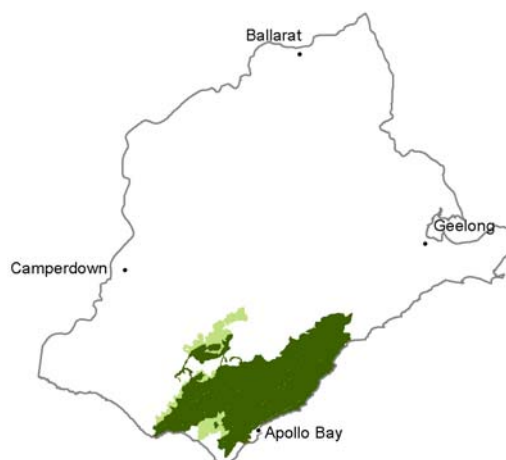


## 7. Brown, yellow, grey and black gradational (earth) soils on Cretaceous sediments

These soils occur on moderately moist and moist/wet aspects of the Southern Uplands underlain by Cretaceous sediments.

The surface soil is a moderately fine structured dark organic fine sandy loam to clay (5–40 cm deep) with an occasional clear change to a weak structured fine sandy loam to fine sandy clay loam subsurface soil (A2 horizon 30–60 cm) which grades into a dark or brown medium to heavy clay subsoil which is often mottled, particularly with depth. Subsoil structure ranges from coarse to fine, often with obvious clay skins. Subsoils are generally strongly acidic with little sodicity evident, the result of increasing rainfall and subsequent leaching. Soil depth is usually greater than 100 cm before grading into weathered sandstone, often clearly. Combined with steep slopes these soils can be slip prone, though high organic matter content of the surface horizons helps stabilise these soils. Friable whole coloured soils occur in the wetter areas.

Notable characteristics include: high clay content with fine sand component, weathered deep profiles with little rock fragment content, gradual increase of clay with depth, variable surface soil depth, pale mottled lower subsoils, strongly acidic but moderate nutrient holding capacity.



### Soil sites

Site code	Soil-landform unit	Component	ASC	FK	1:100 000 mapsheet
CLRA12	153	Hillcrest	Melacic-mottled, Mesotrophic, Brown Dermosol	Gn4.71	T7620 - OTWAY
CLRA27	125	Upper slope	Melanic, ?, Brown Dermosol	Gn4.32	T7821 - SORRENTO
COF1	61	–	Acidic, Eutrophic, Brown Dermosol	Gn3.51	T7520 - PRINCETOWN
OTR414	62	Mid slope	Melacic, Mesotrophic, Black Dermosol	Gn3.41	T7520 - PRINCETOWN
OTR416	61	Mid slope	Acidic-mottled, Mesotrophic, Yellow Dermosol	Gn3.90	T7620 - OTWAY
OTR418	60	Upper slope	Haplic, Mesotrophic, Brown Dermosol	Gn3.21	T7520 - PRINCETOWN
OTR428	60	Mid slope	Acidic, Dystrophic, Brown Dermosol	Gn3.21	T7520 - PRINCETOWN
OTR732	89	Upper slope	Melanic, Mesotrophic, Black Kandosol	Gn2.02	T7721-GEELONG

Site code	Soil-landform unit	Component	ASC	FK	1:100 000 mapsheet
<b>OTR736</b>	59	Upper slope	Melacic, Dystrophic, Brown Dermosol	Uc1.41	T7620-OTWAY
OTR748	65	Mid slope	Acidic-mottled, Magnesian, Brown Dermosol	Gn3.21	T7521-CORANGAMITE
OTR750	87	Mid slope	Acidic-mottled, Magnesian, Brown Dermosol	Gn3.51	T7520 - PRINCETOWN

Site code<sup>1</sup> OTR736



Remnant forest of the Otway Ranges

**Location** Mount Cowley  
**Landform** Hill  
**Geology** Cretaceous Otway Group  
**Element** Upper slope  
**Slope** 33%  
**Aspect** South westerly

Horizon	Depth (cm)	Description
A1	0–25	Very dark greyish brown (10YR3/2); clay loam; moderate subangular blocky structure; diffuse smooth boundary to:
B21	25–30	Dark yellowish brown (10YR3/4); medium clay; friable strong medium (11 mm) subangular blocky structure; gradual boundary to:
B22	30–110	Brown (7.5YR4/4); light clay; friable moderate angular blocky structure (1 mm); angular weathering sandstone fragments common; clear irregular boundary to:
C	110+	Yellowish brown (10YR5/6); light clay; weak subangular blocky structure; weathering sandstone fragments common.



Melacic, Dystrophic, Brown Dermosol

<sup>1</sup> Source: Pitt AJ (1981) A study of the land in the catchments of the Otway Range and adjacent plains. TC-14. Soil Conservation Authority. Kew, Victoria

## Analytical data<sup>2</sup>

Site OTR736 Horizon	Sample depth cm	pH		EC	NaCl	Ex Ca	Ex Mg	Ex K	Ex Na	Ex Al	Ex Acidity	FC -10kPa	PWP -1500kPa	KS	FS	Z	C
		H <sub>2</sub> O	CaCl <sub>2</sub>	dS/m	%	cmol <sub>c</sub> /kg	cmol <sub>c</sub> /kg	cmol <sub>c</sub> /kg	cmol <sub>c</sub> /kg	cmol <sub>c</sub> /kg	mg/kg	cmol <sub>c</sub> /kg	%	%	%	%	%
A1	0-10	5.5	N/R	0.084	0.008	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
A1	10-20	5.3	N/R	0.045	0.005	0.2	0.2	0.5	0.05	N/R	N/R	N/R	N/R	4	41	27	23
A1	20-25	5.2	N/R	0.039	0.003	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
B21	25-30	5.1	N/R	0.038	0.004	0.03	0.06	0.4	0.03	N/R	N/R	N/R	N/R	2	29	23	38
B22	60-90	4.8	N/R	0.039	0.005	<0.01	<0.01	0.4	<0.01	N/R	N/R	N/R	N/R	5	26	19	44
C	120-150	4.9	N/R	0.032	0.004	<0.01	<0.01	0.2	<0.01	N/R	N/R	N/R	N/R	21	42	18	16

## Management considerations

The gradational soil profile has few physical limitations for agricultural production. This allows water and gas (air) to move without physical limitations, but remains dependent on any chemical or depth restrictions. Friable surface soils (and subsoils) occur where there is a build up of organic matter, (and to some extent iron rich clay complexes) generally in cooler wetter areas (less extreme wetting and drying cycling). The acidic subsoil most likely reflects the acidic nature of the parent material or where there has been sufficient leaching of the soil (possibly due to the high rainfall of the Otways). These subsoils affect nutrient availability, creating a nutrient imbalance and the potential for aluminium and manganese toxicity. Deficiencies of calcium, potassium and molybdenum are likely. Charcoal was also observed in the profile at 15cm, possibly an indicator of historic fires.

<sup>2</sup> Source: Government of Victoria State Chemistry Laboratory.