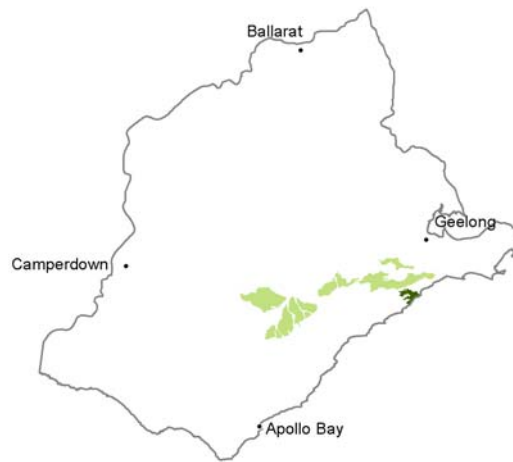


19. Black, grey and brown sodic texture contrast soils on Neogene marl

These soils occur in the south-west of the CMA where dissection of the landscape has exposed marl deposits (Gellibrand Marl). This area has a higher rainfall than the basalt plains to the north and north-east. However the strongly sodic soils are in a less wet area and may have developed on more recently accessed material.

Surface soils are not thick and weakly pedal overlying highly bleached, massive often deep (60+ cm) subsurface horizons which in turn abruptly overlie massive (yellow), mottled, heavy dark clays with occasional columnar structure.

Notable characteristics are the depth to the subsoil (deep upper soil), strong texture contrast and pH change between upper soil (acidic) and subsoil (alkaline) and sodic nature of the subsoil.



Soil sites

Site code	Soil-landform unit	Component	ASC	FK	1:100 000 mapsheet
MM97	78	Upper slope	Eutrophic, Mottled-Subnatric, Brown Sodosol	Dy3.42	T7621 - COLAC
MM238	81	Crest	Calcic, Mottled-Hypernatric, Grey Sodosol	Dy3.33	T7521 - CORANGAMITE
OTR743	180	-	Melanic, Mesonatric, Black Sodosol	Dd1.23	T7621 - COLAC
SW80	78	Flat	Eutrophic, Mottled-Mesonatric, Grey Sodosol	Dd2.42	T7621 - COLAC

Site code¹ OTR743



Near level plains west of Birregurra

Location Birregurra
Landform Plain
Geology Neogene Hanson Plain Sand, calcareous clay
Element Mid slope
Slope 1%
Aspect South-easterly

Horizon	Depth (cm)	Description
A1	0–20	Very dark brown (10YR2/2); fine sandy loam; moderate granular structure (2 mm); diffuse smooth boundary to:
A2	20–38	Very dark brown (10YR2/3); greyish brown (10YR5/2); when dry; sandy clay loam; some ironstone gravel; moderate fine (8 mm) subangular blocky structure; abrupt wavy boundary to:
B21	38–60	Very dark brown (10YR2/2); heavy clay; strong very fine (2 mm) angular blocky structure; very hard when dry consistence; diffuse smooth boundary to:
B22	60–120	Dark greyish brown (2–5YR4/2); heavy clay; strong coarse (35 mm) angular blocky structure with angular blocky fine (2 mm) secondary structure; hard when dry consistence; soft accumulations of calcium carbonate; gradual smooth boundary to:
C1	120–180	Mottled yellowish brown (10YR5/6) and dark grey (2.5YR4/0); heavy clay; strong angular blocky structure; soft accumulations of calcium carbonate; diffuse smooth boundary to:
C2	180+	Olive (5YR5/6) dark grey (2.5YR4/0) mottles; heavy clay; strong angular blocky structure.



Melanic, Mesonatric, Black Sodosol

¹ 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 data²

Site OTR743 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 ₂ O	CaCl ₂	dS/m	%	cmol _c /kg	cmol _c /kg	cmol _c /kg	cmol _c /kg	cmol _c /kg	mg/kg	cmol _c /kg	%	%	%	%	%
A1	0-10	5.0	N/R	0.072	0.008	1.7	2.0	0.3	0.3	N/R	N/R	N/R	N/R	24	42	9	18
A1	10-20	5.1	N/R	0.032	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
A2	20-30	5.4	N/R	0.025	0.003	0.7	1.2	0.1	0.2	N/R	N/R	N/R	N/R	32	45	9	12
B21	38-60	6.5	N/R	0.061	0.006	5.1	8.9	0.4	2.3	N/R	N/R	N/R	N/R	14	24	6	53
B22	90-120	8.7	N/R	0.540	0.037	8.7	17.6	0.4	6.3	N/R	N/R	N/R	N/R	15	23	3	53
C1ca	150-180	8.5	N/R	0.030	0.054	6.5	14.0	0.3	5.9	N/R	N/R	N/R	N/R	14	31	8	46
C2	180-210	8.5	N/R	0.860	0.085	7.1	16.0	0.5	6.5	N/R	N/R	N/R	N/R	10	23	10	44

Management considerations

Strong texture contrast between the surface soil and the subsoil is prominent in this soil. This can have a major effect by reducing and/or redirecting the internal drainage and restricting root growth beyond the upper horizons. The acidic surface soils (topsoil) with a sandy loam texture may be due to the lack of base minerals and may or may not have organic matter (humose or peaty surfaces). This restricts the uptake of certain nutrients as well as intolerance for some plant species (due in part to the increasing mobilisation of aluminium and manganese). The sodic subsoils have poor structure (generally as coarse domed columns) resulting in dispersion (and subsequent clogging of pores), restricting water and gas movement through the subsoil. These soils are hardsetting and have limited opportunity for cultivation without further damage to soil structure. Alkaline subsoils are associated with a high nutrient capacity but result in an imbalance in nutrient availability (may be restrictive to certain plant species (eg. potatoes). Calcium carbonate nodules (segregations, soft and hard) are associated with these alkaline soils.

² Source: Government of Victoria State Chemistry Laboratory.