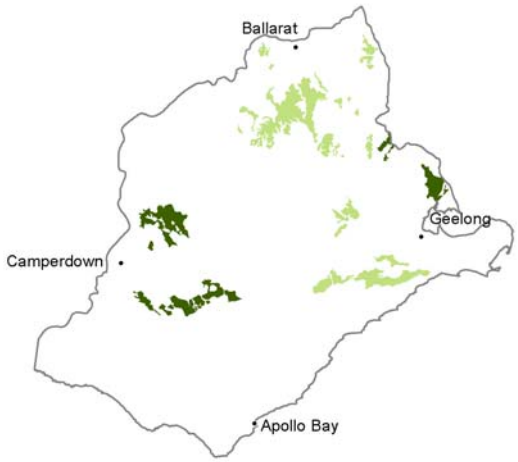
14. Black, brown and grey strongly sodic and sodic mottled texture contrast soils on Neogene sediments



These soils are found on the gently undulating plains, rises or low level plateaux underlain by Neogene sediments (generally sands) which are generally unconsolidated but often have an indurated pan or layer on which the soils have developed.

The surface soil is generally dark with organic matter but light in texture (sandy loam) and between 10 to 20 cm in depth over a (generally) lighter coloured, often hardsetting subsurface horizon (10 to 30 cm in depth) of similar texture or lighter to the surface but containing much less organic matter. The subsurface horizon is often conspicously bleached and may contain buckshot (ferruginous or ferromanganiferous nodules) of up to 50% volume of the subsurface horizon, occasionally more. These horizons abruptly contrast with a dark (black, dark grey or dark brown) upper subsoil with strong coarse structure (often columnar) which then grades into a pale/red mottled lower subsoil which grades into weathered sediments or ferruginised sandstone at about 150 cm (sometimes less depending on topographical and other factors). The dark upper subsoil is a result of organo-clay translocation from above coating the mottled soil aggregates or even replacing the mottle, and is a distinctive feature of soil development on this parent material.

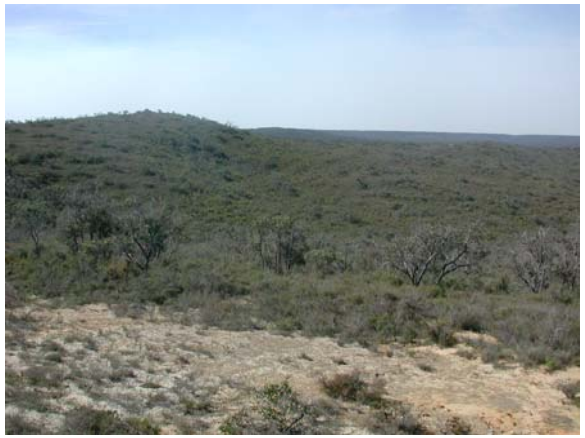
Notable features include: the presence (or absence) of buckshot sitting on top of the subsoil, the sandy nature of the upper soil (occasionally unbleached and may be very coherent, loose or weakly coherent), strong sodicity of the subsoil (and possibly the surface soil as well) and related structural features, and the range of depth to parent material. The role of local climate, particularly rainfall, may influence soil development and such features as tiger mottles in weathered parent material are found further west in the CMA, while these soils tend to be in the drier eastern parts of the CMA.

Soil sites

Site code	Soil-landform unit	Component	ASC	FK	1:100 000 mapsheet
CLRA33	84	Crest	?, Mottled-Subnatric, Red Sodosol	Dr3.42	T7821 - SORRENTO
COF04c	23	-	Magnesic, subnatric, Yellow Sodosol	Dy3.41	T7622 - BALLARAT
MM204	23	Crest	Ferric, Mottled-Subnatric, Brown Sodosol	Dy3.43	T7622 - BALLARAT
MM5006	182	Flat	Ferric, Motted-Subnatric, Brown Sodosol	Dy3.42	T7721 - GEELONG
SW93	172	Simple slope	Ferric, Mottled-Hypernatric, Black Sodosol	Dy5.42	T7721 - GEELONG
SW99	121	Lower slope	Vertic, Mottled-Hypernatric, Grey Sodosol	Dy3.43	T7721 - GEELONG

Site code	Soil-landform unit	Component	ASC	FK	1:100 000 mapsheet
OTR490	89	Mid slope	Calcic, Mesonatric, Brown Sodosol	Dy3.12	T7721 - GEELONG
OTR606	89	Mid slope	Melanic, Mottled-Mesonatric, Brown Sodosol	Dy5.22	T7721 - GEELONG
OTR734	78	Mid slope	Melanic, Mottled-Mesonatric, Brown Sodosol	Db2.21	T6721-COLAC
SFS22	182	Simple slope	Vertic (&Calcic), Mottled-Hypernatric, Brown Sodosol	Db2.43	T7721 - GEELONG
SW100	121	Open depression	Calcic, Hypernatric, Brown Sodosol	Db1.43	T7721 - GEELONG

Site code[1] **OTR606**



Bald Hills landscape

Location	Anglesea Golf Course
Landform	Undulating hills
Geology	Palaeogene Eastern View Formation, fluvial sand, gravel, clay, brown coal
Element	Hillslope – mid slope
Slope	0%
Aspect	-

Melanic, Mottled-Mesonatric, Brown Sodosol

Horizon	Depth (cm)	Description
A1	0–35	Black (10YR2/1); loamy fine sand; apedal single grain structure; clear boundary to:
A2	35–60	Light brownish grey (10YR6/2); loamy fine sand; apedal single grain structure; abrupt boundary to:
B2	60+	Dark yellowish brown (10YR4/4) with grey (10YR5/1) mottles; fine sandy clay; moderate coarse (45 mm) subangular blocky structure; hard when dry.

[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 data[2]

Site OTR606 Horizon	Sample depth cm	pH H_2O	pH $CaCl_2$	EC dS/m	NaCl %	Ex Ca $cmol_c/kg$	Ex Mg $cmol_c/kg$	Ex K $cmol_c/kg$	Ex Na $cmol_c/kg$	Ex Al mg/kg	Ex acidity $cmol_c/kg$	FC (-10kPa) %	PWP (-150kPa) %	KS %	FS %	Z %	C %
A1	0-10	4.4	N/R	0.058	N/R	1.4	1.3	0.1	0.07	N/R	N/R	N/R	N/R	1	77	9	4
A1	10-20	4.4	N/R	0.052	N/R	0.7	0.9	0.1	0.07	N/R	N/R	N/R	N/R	1	80	9	4
A1	20-30	4.7	N/R	0.037	N/R	0.3	0.3	0.07	0.02	N/R	N/R	N/R	N/R	1	82	13	4
A2	50-60	5.5	N/R	0.064	N/R	0.2	0.7	0.1	0.1	N/R	N/R	N/R	N/R	1	80	12	6
B2	60-70	6.0	N/R	0.223	N/R	1.2	8.8	0.5	3.1	N/R	N/R	N/R	N/R	1	43	3	53
B2	130-140	7.4	N/R	0.300	N/R	0.9	5.0	0.3	2.5	N/R	N/R	N/R	N/R	1	59	5	33

Management considerations

Strong texture contrast between the surface soil and the subsoil may reduce and/or redirect the internal drainage and restricting root growth beyond the upper horizons. The sandy topsoil will likely have poor plant water holding and nutrient holding capacities that may be prone to erosion (wind, sheet and rill erosion). These soils may be hydrophobic (in conjunction with organic coatings) when dry, taking time to reabsorb moisture. The sandy topsoils however will drain rapidly. The bleached A2 horizon indicates restricted drainage, poor soil structure (often massive) and low organic matter, nutrient and water holding capacity. These bleached horizons may act as conduit for subsurface flow, particularly on sloping ground. The acidic nature of the upper horizons 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). Sodic subsoils usually 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.

[2] Source: Government of Victoria State Chemistry Laboratory.