Site code[1]	**MM109**
Location	**Ricketts Marsh, Colac district, south-west Victoria**
Landform	Undulating stony rises
Geology	Quaternary Newer Volcanics: *extrusive valley filling basalts*
Element	Plain

Profile morphology

Horizon	Depth (cm)	Description
A1	0–15	Very dark greyish brown (10YR3/2); fine sandy loam; apedal massive structure; weak consistence (dry); clear boundary to:
A2	15–25	Greyish brown (10YR5/2), conspicuously bleached, light grey (10YR7/2 dry); sandy clay loam; apedal massive structure; firm consistence (dry); sharp boundary to:
B21	25–45	Very dark greyish brown (10YR3/2) with grey (10YR4/6) mottles; heavy clay; strong coarse blocky structure; strong consistence (dry); gradual boundary to:
B22	45–80	Dark greyish brown (10YR4/2); heavy clay; strong coarse blocky structure; very firm consistence (moderately moist); boundary to:
B23	80–100	Greyish brown (2.5Y5/2); heavy clay; strong coarse blocky structure; very firm consistence (dry); common calcareous concretions.

ASC: Hypocalcic; Mottled-Hypernatric; Black Sodosol

Analytical data[2]

Site MM109	Sample depth	pH		EC	NaCl	Ex Ca	Ex Mg	Ex K	Ex Na	Ex Al	Ex acidity
Horizon	cm	H_2O	$CaCl_2$	dS/m	%	$cmol_c/kg$	$cmol_c/kg$	$cmol_c/kg$	$cmol_c/kg$	mg/kg	$cmol_c/kg$
A1	0–15	5.7	N/R	0.06	N/R	1.1	1.1	0.1	0.3	21	6.1
A2	15–25	6.3	N/R	0.08	N/R	1.3	1.3	0.1	0.7	0	4.9
B21	25–45	7.9	N/R	0.33	0.06	5.5	5.5	0.7	6.6	N/R	4.4
B22	45–80	8.7	N/R	0.75	0.14	5.2	5.2	0.8	9.3	N/R	0
B23	80–100	9.2	N/R	1.12	N/R	7.6	7.6	0.8	11.9	N/R	0

Site MM109	Sample depth	FC (-10kPa)	PWP (-1500kPa)	KS	FS	Z	C	Org C	Bulk density
Horizon	cm	%	%	%	%	%	%	%	$t\ m^{-3}$
A1	0–15	29.7	7.5	41	36	13	8	1.5	1.33
A2	15–25	N/R	N/R	41	34	12	10	1	N/R
B21	25–45	47.2	27.7	26	19	7	47	N/R	1.19
B22	45–80	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
B23	80–100	N/R	N/R	18	15	9	50	N/R	N/R

Management considerations

This soil has a very strong texture contrast between the fine sandy loam surface soil and the heavy clay subsoil. The clay as a throttle to water and gas movement. Restricted water movement is also evident by the bleached A2 horizons (or subsurface soils). These bleached horizons may act as conduit for subsurface flow, particularly on sloping ground. If the soil is dispersive then gypsum application would be suitable, while increasing organic matter and maintaining vegetative cover is important.

[1] Source: Maher JM, Martin JJ 1987 Soils and landforms of south-western Victoria. Department of Agriculture and Rural Affairs. Research Report No. 40.

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

The subsoil is mottled, sodic and alkaline. These sodic subsoils usually have poor structure (generally as coarse domed columns). The poor structure results in dispersion (and subsequent clogging of pores), restricting water and gas movement through the subsoil, as evidenced by the mottling. These soils are hardsetting and have limited opportunity for cultivation without further damage to soil structure. The application of gypsum is used to counter the effect of the sodicity. Penetration by deep-rooted crops is also useful as is minimum tillage practices which avoids bring the sodic, dispersive material to the surface.

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). These soils are often associated with sodic and calcic soil properties. Growing alkaline tolerant species is a practical option.

Calcium carbonate nodules (segregations, soft and hard) are associated with alkaline soils. This secondary lime is often found in deep subsoils of many basalt-derived soils. As well as growing tolerant species, some micronutrients may be required to bolster essential macronutrients for more adequate plant growth (eg. zinc).