Site code[1] **MM110**

Location **Lake Rosine (Cundare Duverney Road), Cressy district, south-west Victoria**

Landform Undulating basalt plains

Geology Quaternary Newer Volcanics: *extrusive tholeiitic to alkaline basalts, minor scoria and ash*

Element Lower slope

Profile morphology

Horizon	Depth (cm)	Description
A1	0–15	Dark brown (10YR3/3); clay loam; apedal massive structure; firm consistence (dry); common fine ferruginous concretions; sharp boundary to:
B21	15–60	Very dark greyish brown (10YR3/2); heavy clay; strong coarse blocky structure; strong consistence (dry); boundary to:
B22	60+	Greyish brown (2.5Y5/2); medium clay; strong fine blocky structure; firm consistence (moderately moist); common calcareous soft segregations.

ASC: Calcic; Mesonatric; Black Sodosol

Analytical data[2]

Site MM110	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	6.3	N/R	0.12	N/R	3	3	0.9	0.9	0	15.6
B21	15–60	8	N/R	0.29	0.05	4.3	4.3	1.2	5.4	N/R	4.7
B22	60+	N/R	N/R	0.87	0.14	6.3	6.3	1.2	8	N/R	0

Site MM110	Sample depth	FC (-10kPa)	PWP (-1500kPa)	KS	FS	Z	C	Org C	Bulk density
Horizon	cm	%	%	%	%	%	%	%	$t\ m^{-3}$
A1	0–15	29.2	17.9	14	40	19	26	2.6	1.14
B21	15–60	37.2	25.1	7	30	17	45	N/R	1.53
B22	60+	N/R	N/R	12	20	15	40	N/R	N/R

Management considerations

This soil has a very strong texture contrast between the clay loam surface soil and the heavy clay subsoil. The clay acts 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. Ferruginous and Ferromanganiferous nodules in the topsoil may be a further an indication of a periodic waterlogging. These soils are hardsetting and have limited opportunity for cultivation without further damage to soil structure.

The subsoil is sodic and alkaline and also has calcareous nodules associated with it. Sodic subsoils usually have poor structure and may result in dispersive subsoils with subsequent clogging of pores restricting water and gas movement through the subsoil. Alkaline subsoils are usually associated with high nutrient capacity but result in an imbalance in nutrient availability to plants. Calcium carbonate nodules (segregations, soft and hard) are associated with alkaline soils. This secondary lime is often found in deep

[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.

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).
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 bringing the sodic, dispersive material to the surface.