Site code[1] **SW25**

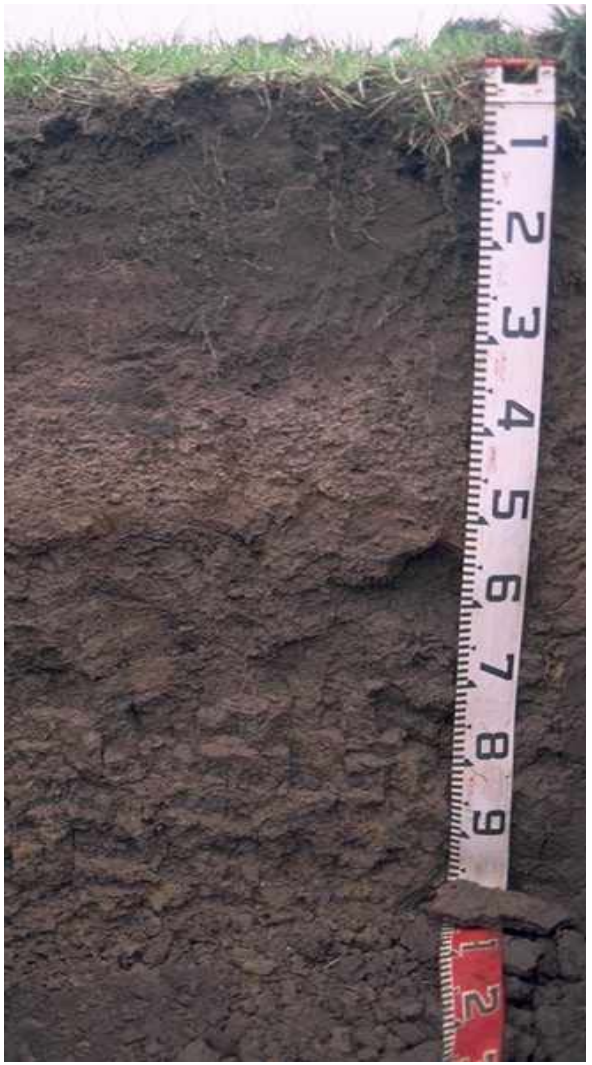
Grazing paddock (dairy)

Location Camperdown

Landform Undulating basalt hills

Geology Quaternary – Newer volcanics (scoria)

Element Valley floor



Ferric (& Sodic), Eutrophic, Brown Chromosol

Horizon	Depth (cm)	Description
A11	0–10	Very dark brown (10YR2/2); very fine sandy clay loam; weak coarse blocky, parting to moderate medium polyhedral structure; very firm consistence (dry); pH 5.3; gradual boundary to:
A12	10–30	Very dark greyish brown (10YR3/2); very fine sandy clay loam; moderate medium polyhedral, parting to moderate to strong fine polyhedral structure; pH 5.3; firm consistence (moist); clear boundary to:
A2	30–50	Dark brown (10YR4/3); conspicuously bleached; gravelly clay loam; contains many (50%) medium size (2-10 mm) ferruginous nodules;pH 6.2; abrupt boundary to:
B21	50–60	Dark brown (7.5YR4/4); medium clay; moderate coarse polyhedral, parting to strong medium polyhedral structure; strong consistence (dry); pH 6.7:
B22	60–80	Dark brown (10YR4/3); medium heavy clay; strong coarse prismatic, parting to medium prismatic parting to moderate coarse blocky structure; strong consistence dry; pH 7.0:
B23	80+	Dark brown (7.5YR4/2) with yellowish brown (10YR5/8) mottles; medium clay; strong coarse prismatic, parting to medium prismatic parting to moderate coarse to medium blocky structure; pH 7.2.

[1] Source: Imhof M, Brown A, Ward G (unpublished) Soils associated with dairy irrigation and winter wet soils in Southwest Victoria

Analytical data[2]

Site SW25	Sample depth	pH		EC	NaCl	Ex Ca	Ex Mg	Ex K	Ex Na	Ex Al	Ex acidity	FC (-10kPa)	PWP (-1500kPa)	KS	FS	Z	C
Horizon	cm	H_2O	$CaCl_2$	dS/m	%	$cmol_c/kg$	$cmol_c/kg$	$cmol_c/kg$	$cmol_c/kg$	mg/kg	$cmol_c/kg$	%	%	%	%	%	%
A11	0–10	5.3	4.7	0.31	0.02	7.9	1.6	1.2	0.1	N/R	N/R	38.6	16	9	34	21	22
A12	10–30	5.3	4.6	0.11	N/R	6.7	2	0.4	0.1	N/R	N/R	34	12.2	9	37	23	23
A2	30–50	6.2	5.3	0.07	N/R	5.1	2.6	0.3	0.2	N/R	N/R	27.9	11.2	23	34	17	22
B21	50–60	6.7	5.8	0.11	N/R	6.2	8.4	0.2	0.8	N/R	N/R	43.8	28.1	6	16	8	64
B22	60–80	7.0	6.1	0.14	N/R	5.9	11	0.3	2	N/R	N/R	51	32	3	12	11	71
B23	80+	7.2	6.2	0.16	N/R	6.6	15	0.3	3.2	N/R	N/R	53	30.6	5	20	16	56

Management considerations

The following comments are made on the basis of examination of a single profile and are therefore indicative only. Fertiliser and lime requirements would need to be verified and quantified through analysis of bulk samples of standard depth taken from across a whole paddock.

The surface (A1) horizons are quite deep (30 cm), well structured (parting to medium to fine polyhedral peds), have low bulk density, reasonable\aeration porosity at field capacity, fairly high water holding capacity, are well draining, and have moderate organic matter levels. These are likely to provide a suitable rooting environment for plants before more adverse conditions are encountered in the deeper subsurface (i.e. large amounts of ferruginous nodules) and subsoil (more dense and coarsely structured). However, the upper surface horizons are strongly acid. This indicates that aluminium and manganese toxicity may occur. Lime can be used to increase soil pH. Other factors need to be considered, however, before lime is recommended (e.g. pasture species grown, method of application, local trial responses, soil surface structure and likely cost/benefit). Manganese toxicity is more likely to occur in poorer drained situations (as waterlogging may bring manganese into solution). If lime is required, and pH increased, then the availability of major nutrients (e.g. phosphorus and some trace elements such as molybdenum) may improve.

The surface soil does appear to have plastic limits at water contents less than field capacity, so care should be taken to avoid over-stocking and trafficking when the surface is moist. Otherwise some structural degradation (e.g. compaction, pugging) may occur.

Ferruginous and ferromanganiferous nodules, and concretions ('buckshot') can restrict root penetration and limit available water holding capacity - forming a discontinuous or continuous pan where concentrated (>50%). Buckshot layers are also an indication of periodic waterlogging. Subsurface drainage may need to be considered where topsoils are shallow.

The strong texture contrast between the surface soil and the subsoil is a very important soil feature. This can have a major effect by reducing and/or redirecting the internal drainage and restricting root growth beyond the upper horizons. Options include reduced tillage, improving organic matter content and altering the subsoil through artificial drainage (ripping, mole drainage) and/or chemical amelioration (gypsum) to improve structure.

From 50 cm depth, the soil profile is generally close to neutral pH levels and suitable for most plants.

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

Due to the deep surface horizons (i.e. 50 cm) the need for mole drainage is negated.