

GRADATIONAL BROWN CLAY

General Description: *Grey brown ironstone gravelly light clay, grading to a brown and yellow well structured medium clay with ironstone gravel throughout, over limestone*

Landform: Very gently undulating plains.

Substrate: Lagoon floor limestone of the Padthaway Formation.

Vegetation: Red gum (*Eucalyptus camaldulensis*).



Type Site: Site No.: SE099
 1:50,000 sheet: 7023-2 (Penola) Hundred: Comaum
 Annual rainfall: 625 mm Sampling date: 07/12/04
 Landform: Slight depression on very gently undulating plain
 Surface: Firm with minor ironstone gravel

Soil Description:

Depth (cm)	Description
0-12	Dark brown firm light clay with moderate granular structure and 10-20% ironstone gravel (6-20 mm). Clear to:
12-30	Yellowish brown, brown and dark greyish brown firm medium clay with strong medium polyhedral structure and 2-10% ironstone gravel (20-60 mm). Gradual to:
30-50	Yellowish brown, dark greyish brown and dark grey firm medium clay with strong medium polyhedral structure and 2-10% ironstone gravel (6-20 mm). Gradual to:
50-85	Yellowish brown, brown and red firm medium clay with weak coarse prismatic structure, breaking to strong medium polyhedral, 2-10% ironstone gravel (6-20 mm), and 2-10% fine manganese segregations. Gradual to:
85-140	Yellowish brown, light yellowish brown and yellowish red firm medium clay with moderate coarse prismatic structure, breaking to strong medium polyhedral, and 2-10% ironstone gravel (6-20 mm).
140-	Calcreted shelly limestone.



Classification: Mottled-Sodic, Eutrophic, Brown Dermosol; medium, gravelly, clayey / clayey, deep

Summary of Properties

Drainage: Moderately well drained. The soil is unlikely to remain wet for more than a week following heavy or prolonged rainfall.

Fertility: Inherent fertility is high, as indicated by the exchangeable cation data. High nutrient retention capacity is due to high clay content throughout, although ironstone gravels tend to tie up phosphorus. Sampling site is outside planted area, so test results for trace elements are low.

pH:

Rooting depth: 140 cm in pit.

Barriers to root growth:

Physical: There are no apparent physical barriers above the limestone.

Chemical: There are no chemical barriers.

Water holding capacity: (Estimates for potential root zone of grape vines)

Total available: 180 mm

Readily available: 75 mm

Seedling emergence: Good to fair. Clayey surface is likely to retain favourable structure.

Workability: Satisfactory, although may become sticky when wet.

Erosion Potential

Water: Low.

Wind: Low.

Laboratory Data

Depth cm	pH H ₂ O	pH CaCl ₂	CO ₃ %	EC 1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	Cl mg/kg	SO ₄ -S mg/kg	Boron mg/kg	Trace Elements mg/kg (EDTA)				Sum cations cmol (+)/kg	Exchangeable Cations cmol(+)/kg				Est. ESP
												Cu	Fe	Zn	Mn		Ca	Mg	Na	K	
0-12	7.0	6.3	0	0.14	0.78	2.91	21	668	24	11.5	1.5	1.54	332	0.77	15.4	21.5	16.4	3.16	0.32	1.70	1.5
12-30	6.9	6.4	0	0.09	0.57	1.31	6	584	22	22.9	1.8	0.56	68	0.10	12.1	20.9	14.2	4.55	0.63	1.49	3.0
30-50	7.4	6.8	0	0.10	0.60	1.05	5	546	25	21.2	1.6	0.56	50	0.11	9.40	21.8	14.3	5.19	0.87	1.49	4.0
50-85	7.2	6.7	0	0.14	0.80	0.44	3	425	46	43.2	0.8	0.19	25	0.06	6.66	19.3	12.3	4.58	1.22	1.20	6.3
85-140	7.4	6.9	0	0.25	1.31	0.41	2	216	83	54.7	0.9	0.28	26	0.05	18.8	23.6	16.0	4.85	2.10	0.65	8.9

Note: Sum of cations, in a neutral to alkaline soil, approximates the CEC (cation exchange capacity), a measure of the soil's capacity to store and release major nutrient elements.

ESP (exchangeable sodium percentage) is derived by dividing the exchangeable sodium value by the CEC, in this case estimated by the sum of cations.