

Driscoll soil – loamy over clayey soil in dolerite and minor aeolian quartz under dry forest

Site description

Occurrence: Mainly on east coast below 500 m where rainfall is in the 500-800 mm range; on hilly and strongly rolling sites (probably having younger soils than much of the dolerite terrain)

Parent Material: In-situ strongly weathered Jurassic dolerite with thin dolerite colluvium cover and aeolian additions at the surface

Landform: Strongly rolling land dissected by hilly and steep-sided gullies

Drainage Class: Well drained and moderately well drained (where mottles occur below 60 cm depth)

Vegetation: Dry sclerophyll forest with *Eucalyptus globulus*, *E. obliqua*, *Acacia* sp. and introduced grasses.



Distinguishing Soil Properties

Profile Features:

- Loamy over clayey profile without a bleached A2 horizon (contrasts with Eastfield soil)
- Upper B horizon is clayey with strong structure
- C horizon is massive or has weak structure (in situ weathered rock)

Chemical and physical features

- Medium total C, total N and total P in topsoil (0-30 cm)
- Very low SO₄-S throughout profile
- High Ca, Mg and K levels
- Moderate aggregate stability
- Permeability – moderate, limited by C horizon (note mottles in described profile)



Similar soils

- Soil 15.1, Forest Soils of Tasmania (Eastfield soil) – prominent pale A2 horizon present
- Soil 15.5, Forest Soils of Tasmania - under dry forest at higher altitude
- Brown soils on dolerite (Spanswick et al. 2000) - red-weathered in subsoils

Soil Degradation Potential

FACTOR	RATING OF DEGRADATION POTENTIAL
Erodibility:	Moderate
Compaction and puddling:	Moderate
Mixing:	Moderate
Nutrient depletion:	Moderate (N and P)
Landslides:	Moderate
Flooding:	Negligible

Site Productivity

Low productivity, limited primarily by low moisture availability and low N, P and S availability

Soil Management

Soils on hilly and steep slopes are prone to erosion following clearing and/or cultivation. Excessive disturbance and burning will reduce productivity.

Native Forest Logging and Regeneration

LOGGING AND CLEARING:

Soils with few stones are unsuitable for wet-weather logging; bouldery and stony soils are suitable for wet-weather logging provided soils are not saturated and runoff is minimised.

PREPARATION FOR REGENERATION:

Scarification of the soil surface or burning is required for good germination. Hot burns not recommended because of low N status. Success of regeneration depends on moisture conditions.

SILVICULTURAL CONSIDERATIONS:

Low water availability limits long-term productivity. Long-term management as a low wood-production forest following appropriate partial logging operations is likely to be the most viable option.

Suitability for Plantations

Marginally suitable to unsuitable for plantations, limited by low productivity and droughtiness

CLEARING: Care must be taken to retain the surface soils

CULTIVATION: Ripping to break up firm subsoils will be beneficial

FERTILISER: N and P and S fertiliser is required at planting and secondary fertilisation is necessary throughout the rotation

Profile

Authors: MDL and PDM

Date: 21.9.00

Location: West side of Buckland Road, Driscolls Hills, 4.5 km north of Buckland

Map reference: Sheet 5428 (Buckland) 563 866

Landform: Midslope of hilly gully side 100 m long

Vegetation: *Eucalyptus globulus*, *Acacia dealbata*, saggs, native cherry, grasses

Parent material: Dolerite colluvium on in situ-dolerite, with aeolian quartz sand in A horizon

Drainage: Well drained

Slope: 18°

Aspect: Northeast

Altitude: 150 m

Photographs: PDM 10-00-4 (site); 9-00-13a (profile)

Australian Soil Classification: **Eutrophic Brown Chromosol**

A1	0-21 cm	Dark greyish brown (10YR4/2) (moist) silty loam; 15% subrounded gravels 10-40 cm diameter; weak strength; weak 1-2 mm subangular blocky structure; abundant fine roots; NaF 0/5.
B2	21-40 cm	Brown (7.5YR4/3) (moist) medium clay; 15% subrounded gravels 10-40 cm diameter; weak strength; strong 5-15 mm blocky structure; prominent dark brown (7.5YR3/2) clay skins on block faces; many fine roots; NaF 0/5.
B3	40-60 cm	Brown (7.5YR4/4) (moist) coarse sandy loam; 10% subrounded gravels 10 cm diameter; firm strength; weak 3-8 mm blocky structure breaking to 2 mm blocky; prominent dark brown (7.5YR3/2) clay skins on block faces; common fine roots; NaF 0/5.
C	60-100 cm	Strong brown (7.5YR5/6) (moist) coarse sandy loam; 30% light olive brown (2.5Y5/3) mottles 20 mm diameter, below 80 cm depth; firm strength; massive; 10% subrounded gravels 10 cm diameter; few roots; NaF 0/5; in situ weathered rock.

Laboratory Analyses

Horizon	Depth (cm)	pH (H ₂ O)	Total C (%)	Total N (%)	C/N	Colwell P (mg/kg)	Total P (mg/kg)	P retn. (%)	SO ₄ -S (mg/kg)	Water-stable aggreg. (%)
	0-30	6.2	3.22	0.20	16	4	170	15	1	<i>n.d.</i>
A1	0-21	6.0	5.13	0.30	17	6	205	17	1	47
B2	21-40	6.5	1.95	0.15	13	3	89	30	1	64
B3	40-60	6.7	0.40	0.04	10	<i>n.d.</i>	266	19	0	65
C	60-90	7.1	0.13	0.02	8	<i>n.d.</i>	243	14	0	62

Horizon	Depth (cm)	Exch. Ca (cmol(+)/kg)	Exch. Mg (cmol(+)/kg)	Exch. K (cmol(+)/kg)	Exch. Na (cmol(+)/kg)	CEC (cmol(+)/kg)	BS (%)
	0-30	14.68	4.71	0.25	0.20	18.4	108
A1	0-21	15.68	4.38	0.34	0.19	22.0	94
B2	21-40	16.31	8.04	0.08	0.41	23.7	105
B3	40-60	12.12	6.54	0.05	0.69	17.5	111
C	60-90	11.71	6.74	0.02	0.61	16.2	118

Analytical methods were those of Blakemore *et al.* (1987), Laffan *et al.* (1996) and Rayment and Higginson (1992), with variation of methods for C, N and SO₄-S (details available from P. D. McIntosh, Forest Practices Board).

References

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- Laffan, M. D.; Grant, J. and Hill, R. 1996. A method for assessing the erodibility of Tasmanian forest soils. *Australian Journal of Soil and Water Conservation* 9: 16 – 22.
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McIntosh, P.D.; Laffan, M.D.; Wong, L.; Miller, M. and Holz, G. 2001. Driscoll soil. *Tasmanian forest soil fact sheet no. 1*. Forest Practices Board, Hobart; Gunns Ltd, Launceston and Forestry Tasmania, Hobart. 4 p.