

Wielangta soil – red clayey soil in dolerite under wet forest

Site description

Occurrence: Mainly on the east coast below 500 m altitude where mean annual rainfall is in the 700-1000 mm range

Parent Material: Deeply weathered dolerite

Landform: Rolling land and hills

Drainage Class: Well drained

Vegetation: Wet eucalypt forest with *Eucalyptus regnans*, *E. globulus*, *Pomaderris apetala*, *Bedfordia salicina*, *Olearia lirata*, *Gahnia* sp., ferns.



Distinguishing Soil Properties

Profile Features:

- Gradational profile - clay loams over clays
- stone content highly variable
- Red colours in subsoils

Chemical and physical features

- Medium total C and total N and high total P in topsoil (0-30 cm)
- High aggregate stability
- Permeability moderate



Similar soils

- Soil 15.4, Forest Soils of Tasmania - at higher altitude (under *E. delegatensis* forest); red colours not so pronounced
- Excalibur soil (Laffan et al. 1995) - at higher altitude, in northeast Tasmania
- Bream soil (Tasmanian forest soil factsheet no. 6) - lower P status and nutrients, weaker structure and thinner A horizon; under dry forest.

Soil Degradation Potential

FACTOR	RATING OF DEGRADATION POTENTIAL
Erodibility:	Low
Compaction and puddling:	Moderate
Mixing:	Moderate
Nutrient depletion:	Low
Landslides:	Slight to Moderate
Flooding:	Negligible

Site Productivity

High – generally adequate moisture and nutrients. Very stony soils will have lower productivity

Soil Management

These soils are suitable for wet-weather logging only when stones are abundant on the soil surface.
Although the soils are generally fertile N status is moderate and loss of the A horizon by mixing or very hot burning may reduce long-term productivity.

Native Forest Logging and Regeneration

LOGGING AND CLEARING:
Matting and/or cording should be used as the soils are clayey and prone to rutting and mixing.
PREPARATION FOR REGENERATION:
Normal burning procedures should produce good regeneration, but to conserve nutrients in topsoil organic matter, avoid very hot burns.
SILVICULTURAL CONSIDERATIONS:
These soils are some of the highest quality sites on the east coast and *E. regnans*/*E. globulus* forest can be regenerated by normal techniques.

Suitability for Plantations

Highly suitable for plantations – N and P fertiliser will be required at planting and secondary fertilisation may be required for subsequent rotations
CLEARING: Dozer clearing should be done using a rake blade to conserve nutrients; avoid burning in second rotations.
CULTIVATION: Ripping of firm subsoil may be required to achieve high productivity.
FERTILISER TREATMENT: Site preparation may lead to low initial nutrient availability (particularly P). Fertilising planted seedlings is required.

Profile

Authors: MDL and PDM

Date: 22.9.00

Location: North side of turnoff to N road, off the main Wielangta Road, east of gate across road

Map reference: Sheet 5626 (Kellevie) 686 695

Landform: Midslope in rolling landscape.

Vegetation: *Eucalyptus regnans*, *E. globulus*, *Pomaderris apetala*, *Bedfordia salicina*, *Olearia lirata*, *Gahnia* sp., ferns

Parent material: Strongly weathered dolerite

Drainage: Well drained

Slope: 15°

Aspect: Southeast

Altitude: 330 m

Photographs: PDM 10-00-24 (site); PDM 10-00-16 (profile)

Australian Soil Classification: **Red Eutrophic Ferrosol***

A1	0-13 cm	Dark brown (7.5YR3/2) (moist) silty clay loam; 20% subangular gravels 100-300 mm diameter; weak strength; moderate 5-10 mm granular structure; abundant fine and many coarse roots; NaF 0/5.
AB	13-28 cm	Brown (7.5YR4/3) (moist) silty clay; weak strength; moderate 5-15 mm blocky structure; common medium and few coarse roots; NaF 0/5.
B21	28-57 cm	Yellowish red (5YR5/6) (moist) medium clay (60% clay, estimate); firm strength; weak 20-40 mm blocky structure; few coarse roots; NaF 0/5.
B22	57-110+cm	Red (2.5YR5/6) (moist) medium clay (60% clay, estimate); 10% brownish yellow (10YR6/6) mottles 10-120 mm diameter (strongly weathered dolerite gravels); few coarse roots; NaF 0/5.

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	5.5	4.51	0.26	17	12	398	53	7	<i>n.d.</i>
A1	0-13	5.6	5.71	0.32	18	8	444	50	9	75
AB	13-28	5.5	2.20	0.15	15	7	358	57	14	91
B21	28-57	5.3	1.60	0.10	16	<i>n.d.</i>	216	54	23	86
B22	57-110+	5.5	0.59	0.04	14	<i>n.d.</i>	215	51	24	81

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	6.66	4.05	1.48	0.24	26.4	47
A1	0-13	8.16	3.67	1.46	0.25	27.3	50
AB	13-28	4.13	3.70	1.37	0.22	21.6	44
B21	28-57	4.12	4.33	1.09	0.34	26.1	38
B22	57-110+	5.12	5.65	1.25	0.44	28.5	44

* Citrate-dithionite Fe = 6.0 and 5.5% in B21 and B22 horizons respectively

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

- Blakemore, L. C.; Searle, P. L. and Daly, B. K. 1987. Methods of chemical analysis of soils. *New Zealand Soil Bureau Scientific Report 80*.
- Laffan, M.D.; Grant, J. and Hill, R. 1995. Soils of Tasmanian State Forests 1. Pipers Sheet. *Soils Bulletin No. 1*. Forestry Tasmania, Hobart, 271 pages plus maps.
- 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.
- Rayment, G. E, and Higginson, F. R. 1992. Australian Laboratory Handbook of Soil and Water Chemical Methods. Incarta Press, Melbourne. 330p.
- Spanswick, S.; Kidd, D.; Loveday, J. and Dimmock, G. M. 2000. Buckland Soil Report. A revised edition of Divisional Report 13/57 Buckland. DPIWE, Tasmania, 44 pages plus map.

Acknowledgements

To Gunns Ltd and Forestry Tasmania, for funding soil analyses.

Citation:

McIntosh, P.D.; Laffan, M.D.; Wong, L.; Miller, M. and Holz, G. 2001. Wielangta soil. *Tasmanian forest soil fact sheet no. 5*. Forest Practices Board, Hobart, Gunns Ltd, Launceston and Forestry Tasmania, Hobart. 4 p.

19 December 2002
