Tasmanian forest soil fact sheet no. 23

Lauderdale soil – gradational soil in Tertiary sediments derived from granite, under dry forest

Site description

Occurrence: In northeastern lowland Tasmania where mean annual rainfall is <1100 mm
Parent Material: Tertiary sediments derived from granite
Landform: Undulating land
Drainage Class: Well drained
Vegetation: Dry sclerophyll forest with *Eucalyptus amygdalina*, *E. obliqua*, *Banksia marginata* and *Pteridium esculentum*

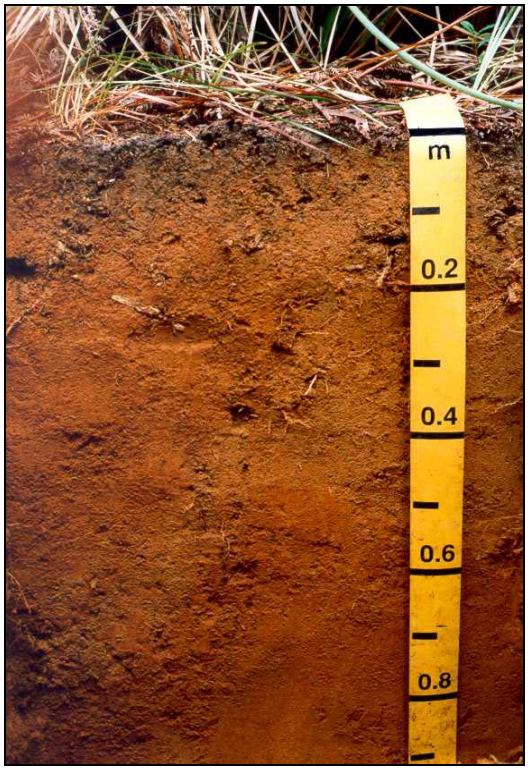
Distinguishing Soil Properties

Profile features:

- Gradational profile with loamy over clay loam and clay textures
- Yellowish red colours in subsoil horizons
- Mottled B2 horizon

Chemical and physical features

- Low total C, total N and moderate total P in surface layer (0-30 cm)
- Moderate ability to retain added P (low to medium P retention)
- Permeability – medium



Similar soils

- Wurrawa soil (Forest soil fact sheet no. 19) – similar morphology on in-situ granite; subsoil colours are brown, not red
- Fraser soil (Forest soil fact sheet no. 14) – on in-situ granodiorite

Previous description

Lauderdale soils were described by Laffan et al. (1995) but not analysed

Soil Degradation Potential

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

Site Productivity

Low productivity due to low levels of nutrients.

Soil Management

These soils are low in nutrients and are easily degraded. Management must ensure minimal loss or disturbance of surface layers where organic matter and nutrients are concentrated. Burning should be minimised.

Native Forest Logging and Regeneration

LOGGING AND CLEARING:
Nutrient levels are low and concentrated in the thin surface horizon. The soils are prone to degradation by erosion especially after burning. Selective logging rather than clearfelling is appropriate. Suitable for wet-weather logging provided soils are not saturated.
PREPARATION FOR REGENERATION:
Minimal seedbed preparation is required. Disturbance during logging should be sufficient. Burning should be minimised. Avoid broadcast burning. Restrict burning to debris piles and head burns.
SILVICULTURAL CONSIDERATIONS:
Low nutrient status limits long-term productivity. Long rotations are required between harvests. Long-term management using partial logging techniques is likely to be a viable and sustainable option.

Suitability for Plantations

Marginally suitable for plantations due to low site productivity.
CLEARING: Dozer clearing must be done using a rake blade.
CULTIVATION: Ripping to >50 cm depth is required so that roots can penetrate into the firm B2 horizon and utilise the full profile for nutrients and water.
FERTILISER TREATMENT: Fertilising planted seedlings is required. Secondary fertilisation will be necessary.

Profile

Authors: M.D. Laffan and P.D. McIntosh
Date: 24 June 1999
Location: Pit on Lauderdale Road, Scottsdale (off Bridport Road)
Map reference: Sheet 5244 (Nabowla) 538500 5447900
Landform: Crest of low ridge in undulating landscape
Vegetation: *Eucalyptus obliqua* (dominant) and *E. amygdalina* forest; understorey of *Pteridium esculentum*, *Acacia verticillata*, *Casuarina* sp., *Banksia marginata*, *Bedfordia salicina* and saggs
Parent material: Tertiary granitic outwash; lack of gravels may indicate a local aeolian deposit
Drainage: Moderately well drained
Slope: 2°
Aspect: North
Altitude: 100 m
Photographs: PDM 4-02.6 (site); 6-99-3 (profile)
Australian Soil Classification: **Dystrophic Red Dermosol**

A11	0-1 cm	Very dark grey (10YR3/1) (moist) sandy loam; loose; single grain; common roots.
A12	1-7 cm	Brown (10YR4/3) (moist) sandy loam; weak strength; weak 20 mm blocky structure; common roots; NaF 0/5.
B1	7-20 cm	Reddish brown (5YR5/4) (moist) clay loam; 10% 5 mm mottles 2.5Y5/3; weak strength; weak 20-50 cm blocky structure; charcoal flecks; NaF 0/5.
B21	20-65 (-80) cm	Yellowish red (5YR5/6) (moist) silty clay loam; 20% strong brown (7.5YR5/6) mottles 10-20 cm diameter; weak strength; massive (yellowish red zones) and loose, single grain (strong brown zones); common roots; NaF 0/5.
B22	65 (80)-100+cm	Yellowish red (5YR5/6) (moist) silty clay; 40% brown (7.5YR4/4) mottles 5-10 mm diameter; firm strength; brittle; weak to moderate 10 mm blocky structure; common roots; NaF 0/5.

Note: 0-7 cm depth sampled as one unit.

Laboratory Analyses

Horizon	Depth (cm)	pH (H_2O)	Total C (%)	Total N (%)	C/N	Total P (mg/kg)	Citrate-dithionite Fe (%)	Colwell P (mg/kg)	P retn. (%)	Water stable aggreg. (%)
	0-30	*n.d.*	*1.1*	*0.06*	*18*	*142*	*n.d.*	*0.7*	*n.d.*	*n.d.*
A11&12	0-7	5.5	3.8	0.15	25	172	1.9	3.4	22	51
B1	7-20	5.5	1.7	0.07	24	164	3.4	0.9	28	57
B21	20-75	5.8	0.5	0.01	-	101	3.0	0.4	25	27
B22	75-100	6.2	0.4	0.01	-	172	4.8	0.7	43	n.d.

Analytical methods were those of Blakemore et al. (1987), Laffan et al. (1996) and Rayment and Higginson (1992), except that total C was analysed by the Walkley/Black digestion method.

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.; Grant, J. and Hill, R. 1995. Soils of Tasmanian State Forests 1. Pipers Sheet. *Soils Bulletin 1*. Forestry Tasmania, Hobart.

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. 330 p.

Acknowledgements

To Forestry Tasmania and the Forest Practices Board for funding soil analyses.

Citation

Laffan, M.D. and McIntosh, P.D. 2002. Lauderdale soil. *Tasmanian forest soil fact sheet no. 23.* Forest Practices Board, Hobart and Forestry Tasmania, Hobart. 4 p.

15 March 2002