

Oxberry soil – clayey soil in granite, under dry forest

Site description

Occurrence: In northeast Tasmania at low altitude where mean annual rainfall is <800 mm
Parent Material: Deeply weathered in-situ granite
Landform: Rolling land
Drainage Class: Moderately well drained
Vegetation: Dry forest with *Eucalyptus obliqua*, *Casuarina*, *Acacia mearnsii* and *Banksia marginata* with an understorey of saggs and bracken.

Distinguishing Soil Properties

Profile Features:

- Very thin organic layer (A1 horizon)
- Very thin bleached sandy A2 horizon
- Clayey subsoils with coarse blocky and prismatic peds
- Grey mottling in subsoils
- Prominent clay-organic coats on peds in subsoils (see photograph)

Chemical and physical features

- Low total C, N and P in surface layer (0–30 cm, by calculation)
- Permeability – moderate to slow, limited by strong B2 and B3 horizons

Similar soils

- Wurrawa soil (Forest soil fact sheet no. 19) – no A2 horizon, finer structure in subsoils, no mottles; Wurrawa soil occurs under higher rainfall and can be associated with Stronach or Jensen soils; Oxberry soil is always associated with Jensen soil
- Fraser soil (Forest soil fact sheet no. 14) – gradational soil with thin A1 horizon and weakly bleached A2 horizon in granodiorite under dry forest



Soil Degradation Potential

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

Site Productivity

Low productivity, limited by low reserves of nutrients and coarse subsoil structure which may restrict root penetration

Soil Management

Low nutrients and association of this soil with more erodible nutrient-poor texture contrast soils (e.g. Jensen soils) limit plantation potential. Nutrients are concentrated in the thin surface horizons which should be left intact as far as possible.

Native Forest Logging and Regeneration

LOGGING AND CLEARING:

Because nutrients are low and concentrated in the surface horizon, subsoil mottling, mixing of topsoils and subsoils is a risk; general cording and matting is not practical, so logging should be done in dry weather only. If pale subsoils (A2 horizons) are exposed on snig tracks these areas should be matted before further passes by machines

PREPARATION FOR REGENERATION:

Scarification or burning is required to prepare a seedbed. Hot burns must be avoided – use head burns only.

SILVICULTURAL CONSIDERATIONS:

Partial harvest methods are appropriate.

Suitability for Plantations

Marginally suitable for plantations; suitability is limited by nutrients and coarse subsoil structure which limits the soil volume available for roots; also by association with Jensen soils.

CLEARING: Dozer clearing must be done using a rake blade.

CULTIVATION: Ripping to >50 cm depth is required so that roots can penetrate into and beneath the B2 horizon and utilise the full profile for nutrients and water.

FERTILISER TREATMENT: Fertilising planted seedlings is required. Secondary fertilisation may be necessary.

Profile

Authors: P.D. McIntosh and M.D. Laffan

Date: 4 April 2002

Location: Western side (uphill) of access road to coupe SF102A, east of Old Waterhouse Road, 6 km northeast of Scottsdale

Map reference (AGD): Sheet 5444 (Scottsdale) 548700 5447500

Landform: Midslope in rolling terrain

Vegetation: Dry forest with *Eucalyptus obliqua*, *Casuarina* sp., *Acacia mearnsii*, *Epacris impressa*, *Pomaderris elliptica*, *Banksia marginata*, sags and bracken.

Parent material: Deeply weathered granite

Drainage: Moderately well drained, limited by strong consistence and coarse structure below 35 cm depth

Slope: 8°

Aspect: North

Altitude: 150 m

Photographs: PDM 4-02-10 (site); 4-02-8 (profile)

Australian Soil Classification: **Bleached-Acidic Mesotrophic Brown Dermosol**

A1	0–2.5 cm	Dark greyish brown (10YR4/2) (moist) loamy sand; very weak strength; weak 8 mm polyhedral peds; abundant fine and medium roots.
A2	2.5–5 cm	Greyish brown (2.5Y5/2) (moist) loamy sand; very weak structure; single grain; abundant fine and medium roots.
B21	5–35 cm	Brownish yellow (10YR6/6) (moist) light clay; strong; moderately developed 20–80 mm angular blocky peds; thin brown (7.5YR5/3) clay coatings on some ped surfaces; 10% angular quartz gravels 3–4 mm diameter; common medium roots.
B22	35–60 cm	Yellow (10YR7/6) (moist) light medium clay; 30% yellowish brown (10YR5/6) mottles 5 mm diameter; strong; weakly developed 200 mm prismatic peds breaking to 100 mm angular blocky peds; common prominent brown (10YR5/3) clay-organic coatings on ped surfaces; 10% angular quartz gravels 3–4 mm diameter; few fine and medium roots.
B3	60–90+cm	Light yellowish brown (2.5Y6/3) (moist) light clay; 5% reddish brown (10YR6/6) mottles 10 mm diameter; 10% yellowish brown (10YR6/6) mottles 10 mm diameter; strong; weak 80 mm blocky structure; common prominent brown (10YR5/3) clay-organic coatings on ped surfaces; 10% angular quartz gravels 3–4 mm diameter; common strongly weathered granite inclusions 100 mm diameter; few fine roots.

Horizon	Depth (cm)	pH (H ₂ O)	Total C (%)	Total N (%)	C/N	Total P (mg/kg)	Colwell P (mg/kg)	P retn. (%)	Water Stable Aggreg. (%)
A1/A2	0–5	5.7	3.18	0.126	25	59	1.3	7	n.d.
B21	5–35	5.8	1.47	0.064	23	68	0.0	33	n.d.
B22	35–60	5.9	0.72	0.038	19	78	0.0	36	n.d.
B3	60–90	5.8	0.04	0.024	-	76	0.0	35	n.d.

Horizon	Depth (cm)	Exch. Ca (cmol(+)/kg)	Exch. Mg (cmol(+)/kg)	Exch. K (cmol(+)/kg)	Exch. Na (cmol(+)/kg)	CEC (cmol(+)/kg)	BS (%)
A1/A2	0–5	2.5	0.74	0.19	n.d.	n.d.	n.d.
B21	5–35	0.44	0.91	0.22	n.d.	n.d.	n.d.
B22	35–60	0.59	2.51	0.32	n.d.	n.d.	n.d.
B3	60–90	0.58	2.38	0.29	n.d.	n.d.	n.d.

Analyses by PP 16.5.02

Analytical methods were those of Blakemore et al. (1987) 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*.
- Rayment, G. E, and Higginson, F. R. 1992. Australian Laboratory Handbook of Soil and Water Chemical Methods. Incarta Press, Melbourne. 330p.

Acknowledgements

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Citation

McIntosh, P.D. and Laffan, M.D. 2005. Waterhouse soil. *Tasmanian forest soil fact sheet no. 33*. Forest Practices Board, Hobart and Forestry Tasmania, Hobart. 4 p.

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