

# Taranna soil – texture-contrast soil in aeolian sand on dolerite under moist forest

## Site description

*Occurrence:* In southeast Tasmania on low-altitude near-coastal sites where mean annual rainfall is <1000 mm

*Parent Material:* Aeolian sand over dolerite

*Landform:* Dolerite bench

*Drainage Class:* Imperfectly drained

*Vegetation:* Moist forest with *Eucalyptus obliqua*, *Gahnia* and bracken understorey

## Distinguishing Soil Properties

### Profile Features:

- Sandy and sandy loam textures in upper soil horizons
- Prominent bleached horizon
- Prominent humus pan
- Clayey textures in lower horizons formed in dolerite

### Chemical and physical features

- Medium total C and N and low total P in surface layer (0–30 cm)
- Permeability – slow, limited by firm Bh horizon
- A2 horizon with weak strength and very low water-stable aggregate values (high erodibility)

## Similar soils

- Sandbrook soil (Forest soil fact sheet no. 3) – similar soil on sandstone, no weathered dolerite at depth



## Soil Degradation Potential

FACTOR	RATING OF DEGRADATION POTENTIAL
Erodibility:	High
Compaction and puddling:	Low
Mixing:	Moderate
Nutrient depletion:	High (for P); moderate (for other nutrients)
Landslides:	Negligible
Flooding:	Negligible

## Site Productivity

Moderate productivity, limited by nutrients. The dolerite in the deep subsoil may be a significant source of nutrients for older trees whose roots have penetrated below 40 cm depth, but P is likely to be limiting

## Soil Management

High erodibility limits plantation potential on these soils. Nutrients are concentrated in surface horizons which should be left intact as far as possible.

## Native Forest Logging and Regeneration

### LOGGING AND CLEARING:

Nutrient levels are concentrated in the surface horizon. Cording and matting should be used if possible

### PREPARATION FOR REGENERATION:

Scarification or burning is required to prepare a seedbed.

### SILVICULTURAL CONSIDERATIONS:

Normal Code provisions for clearfell and burning in high erodibility soils apply.

## Suitability for Plantations

**Marginally suitable** for plantations; suitability is limited by nutrients and high erodibility.

**CLEARING:** Dozer clearing is not recommended – use an excavator.

**CULTIVATION:** Spot cultivation is recommended. Ripping to >50 cm depth would be beneficial so that roots can penetrate into and beneath the Bh horizon (pan) and utilise the full profile for nutrients and water. However, ripping should only be done when ground conditions are dry; where drainage is imperfect or poor ripping should be avoided.

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

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## Profile

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Date: 21 December 2000

Location: 30 m north of Canoe Bay Road

Map reference (AGD): Sheet 5722 (Hippolyte) 575900 5223500

Landform: Dunesand-covered dolerite bench in hilly terrain

Vegetation: Moist forest dominated by *Eucalyptus obliqua*, with bracken and *Gahnia* understorey.

Parent material: Aeolian sand over weathered dolerite

Drainage: Imperfectly drained, limited by pan at 40 cm depth

Slope: 3°

Aspect: South

Altitude: 120 m

Photographs: PDM 12-00-26 (site); 12-00-21 (profile)

Australian Soil Classification: **Humic Semiaquic Podosol**

A11	0–5 cm	Very dark greyish brown (10YR3/2) (moist) heavy loam; loose strength; single grain; many medium roots; NaF 0/5.
A12	5–21 cm	Dark grey (10YR4/1) (moist) fine sandy loam; very weak strength; single grain; abundant medium roots; NaF 0/5.
A2	21–40 (45) cm	Grey (2.5Y6/1) (moist) loamy fine sand; weak strength; massive; common medium roots; NaF 0/5.
Bh	40 (45)–49 cm	Greyish brown (2.5Y5/2) (moist) sandy loam*; 30% brown (10YR5/3) mottles 5 mm diameter; 5% very dark greyish brown (10YR3/2) mottles 5 mm diameter; 10% gravels (concretions) 3 mm diameter; abundant clay bands 1 mm thick; firm strength; massive; common medium roots; NaF 0/5.
B2	49–73 cm	Strong brown (7.5YR4/6) gravelly clay loam; firm strength; moderately developed subangular blocky structure 5–10 mm diameter; 30% dark olive brown (2.5Y3/3) coatings on blocks; few medium roots; NaF 2/5.
Bg	73–83 cm	Light grey (5Y7/2) light medium clay; 40% brownish yellow mottles 1–5 mm diameter; firm strength; massive; few coarse roots; NaF 0/5.

\*The greyish brown soil volumes are continuous with the A2 horizon above

Horizon	Depth (cm)	pH (H <sub>2</sub> O)	Total C (%)	Total N (%)	C/N	Total P (ppm)	Colwell P (mg/kg)	P retn. (%)	SO <sub>4</sub> -S (mg/kg)	Water Stable Aggreg. (%)
	<b>0–30</b>	4.3	3.67	0.15	25	55	3	0	0.4	n.d.
A11	0–5	4.3	21.5	0.80	27	167	12	0	2.2	n.d.
A12	5–21	4.3	2.62	0.11	23	44	2	0	3.7	18
A2	21–40	4.5	0.31	0.00	66	30	n.d.	0	0.5	3
Bh	40–49	4.8	1.41	0.05	29	43	n.d.	21	2.9	34
B2	49–73	5.0	6.20	0.19	33	76	n.d.	62	65	57
Bg	73–83	4.9	1.00	0.03	32	15	n.d.	35	42	50

Horizon	Depth (cm)	Exch. Ca (cmol(+)/kg)	Exch. Mg (cmol(+)/kg)	Exch. K (cmol(+)/kg)	Exch. Na (cmol(+)/kg)	CEC (cmol(+)/kg)	BS (%)
	<b>0–30</b>	0.92	1.16	0.32	0.28	9.9	27
A11	0–5	8.81	5.53	0.55	0.80	43.8	36
A12	5–21	0.73	0.62	0.14	0.15	6.1	27
A2	21–40	0.20	0.13	0.04	0.04	0.7	57
Bh	40–49	0.17	0.79	0.03	0.24	6.4	19
B2	49–73	0.86	3.35	0.07	1.08	36.1	15
Bg	73–83	1.98	7.54	0.17	2.00	17.4	67

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. 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.

## **Acknowledgements**

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## **Citation**

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