Jensen soil, variant – texture-contrast soil in granite under dry forest

Site description

Occurrence: In northeastern lowland Tasmania where mean annual rainfall is <1100 mm
Parent Material: In-situ granite
Landform: Undulating and rolling hills
Drainage Class: Imperfectly drained
Vegetation: Dry sclerophyll forest with *Eucalyptus amygdalina*, *E. obliqua* and *Pteridium esculentum*

Distinguishing Soil Properties

Profile Features:

- Texture-contrast profile with coarse sand over sandy clay loam and clay
- Uncemented loose lower A2 horizon
- Mottled B2 horizon

Chemical and physical features

- Low total C, total N and total P in surface layer (0–30 cm)
- Low ability to retain added P (very low P retention) in upper horizons
- Permeability – slow

Similar soils

- Soil 11.2, Forest Soils of Tasmania (Jensen soil) – similar morphology except that the lower A2 horizon is cemented
- Mckay soil (Laffan et al. 1995; Grant et al. 1995; Laffan et al. 2002) – similar profile in granodiorite

Soil Degradation Potential

FACTOR	RATING OF DEGRADATION POTENTIAL
Erodibility:	High
Compaction and puddling:	High
Mixing:	Low
Nutrient depletion:	High (N, P and probably S)
Landslides:	Negligible
Flooding:	Negligible

Site Productivity

Low productivity due to severe limitations of limited rooting volume in subsoils and low 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:
Minimise the area used for snig tracks. Routine matting and cording is not possible because of sparse understorey but where pale subsoils (A2 horizons) are exposed on snig tracks these areas should be matted before further passes by machines. Generally unsuitable for wet-weather logging.
PREPARATION FOR REGENERATION:
Minimal burning is required for regeneration. Harvest disturbance and head burns will generally be sufficient. Widespread hot burns will deplete low nutrient levels.
SILVICULTURAL CONSIDERATIONS:
Selective harvest methods such as seed tree retention are appropriate. Long rotations are required.

Suitability for Plantations

Marginally suitable or **unsuitable** for plantations because of low 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: 25 June 1999
Location: Pit near Wurrawa Road, Goulds country
Map reference: Sheet 5844 (Spurrs Rivulet) 592700 5444600
Landform: Convex upper midslope of ridge in rolling landscape
Vegetation: *Eucalyptus obliqua* and *E. amygdalina*
Parent material: Granite
Drainage: Imperfectly drained
Slope: 4°
Aspect: South
Altitude: 210 m
Photographs: PDM 1-02.13 (site); 1-02-11 (profile)
Australian Soil Classification: **Bleached-Mottled Dystrophic Yellow Kurosol**

A1	0-7 cm	Very dark grey (10YR3/1) (moist) coarse sandy loam; loose strength; single grain; 30% subangular gravels 2-4 mm diameter; many roots; NaF 0/5.
A21e	7-25 cm	Light brownish grey (2.5Y6/2) (moist) loamy coarse sand; loose strength; single grain; 30% subangular gravels 2-4 mm diameter; common roots; NaF 0/5.
A22e	25-38 cm	Light yellowish brown (2.5Y6/3) (moist) coarse sandy clay loam; 5% light brownish grey (2.5Y6/2) mottles 10-50 mm diameter; 2% brownish yellow mottles 6 mm diameter; weak strength; massive; 10% subangular gravels 2-4 mm diameter; few roots; NaF 0/5.
B2h	38-75 cm	Brownish yellow (10YR6/6) (moist) light clay; 10% greyish brown veins 10 mm wide; 10% yellow (10YR7/8) strongly weathered granite (in-situ) inclusions, 50 mm diameter; firm strength; moderate 100 mm blocky structure; 5% dark greyish brown humus coatings on block faces; 5% subangular gravels 2-4 mm diameter; few roots; NaF 0/5.
C	75+ cm	Moderately weathered granite.

Laboratory Analyses

Horizon	Depth (cm)	pH (H_2O)	Total C (%)	Total N (%)	C/N	Colwell P (mg/kg)	Total P (mg/kg)	P retn. (%)	Water-stable aggreg. (%)
	0-30	*4.9*	*0.8*	*0.03*	*27*	*1.0*	*78*	*n.d.*	*n.d.*
A1	0-7	4.6	2.4	0.10	25	2.9	99	5	53
A2	7-25	4.8	0.9	0.04	19	0.8	85	8	43
B1	25-38	4.9	0.5	0.03	19	0.3	117	14	24
B2h*	38-75	5.1	0.7	0.02	-	0.0	85	29	39

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. March 2002 repeats incorporated.
* Citrate-dithionite Fe = 1.8% in the B2h horizon.

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