This Technical Data Sheet describes the *typical average properties* of the specified soil.
It is essentially a summary of information obtained from one or more profiles of this soil that were examined and described during the Topoclimate survey or previous surveys. It has been prepared in good faith by trained staff within time and budgetary limits. However, no responsibility or liability can be taken for the accuracy of the information and interpretations. Advise should be sought from soil and landuse experts before making landuse decisions on individual farms and paddocks. The characteristics of the soil at a specific location may differ in some details from those described here. No warranties are expressed or implied unless stated.

Soil name: Lintley

Overview

Lintley soils occupy about 2700 ha in northern Southland on fans adjacent to the Lintley range between Balfour and Jollies Pass. They are formed into alluvial fan gravels mixed with a thin mantle of loess derived from greywacke. Lintley soils are shallow (<45 cm to gravel) and free draining. They are moderately fertile, with silty to sandy texture, but the rooting depth and water capacity is limited by the gravel. Present use is pastoral grazing with sheep deer and beef cattle with some cropping. Climate is cold in the winter with warm summers, when soils can seasonally dry out.

Soil classification

NZ Soil Classification (NZSC): Pallic Orthic Brown; angular-stony, hard sandstone; silty
Previous NZ Genetic Classification: Intergrade between yellow-brown and yellow-grey earth.

Classification explanation

The NZSC of Lintley soils is consistent with previous classifications. Lintley soils have a moderately developed B horizon that is weakly leached, with pale yellow-brown colours and P-retention of 25–35%. Lintley soils have silty textures, and gravel within 45cm depth.

Soil phases and variants

Identified units in the Lintley soils are:

- Lintley undulating shallow (LiU3): has gravel within 45cm depth; occurs on slopes of 0–7°
- Lintley undulating shallow imperfectly drained variant (LiU3vi): has imperfect drainage; has gravel within 45cm depth; occurs on slopes of 0–7°
- Lintley undulating moderately deep (LiU2): has gravel between 45 and 90cm depth; occurs on slopes of 0–7°
- Lintley rolling shallow (LiR3): has gravel within 45cm depth; occurs on slopes of 7–15°

The soil properties described in this Technical Data Sheet are based on the most common phase, Lintley undulating shallow (LiU3). Values for other phases and variants can be taken as being similar. Where they differ significantly they are recorded with a separate versatility rating, e.g., Lintley rolling shallow (LiR3).

Associated soils

Some soils that commonly occur in association with Lintley soils are:

- Longridge: poorly drained equivalent of the Lintley soil
- Waikoikoi: deep soils formed in loess; poorly drained soil with a fragipan
- Mossburn: deep to moderately deep soil formed in mixed loess and fan alluvium; poorly drained soil with a fragipan
- Crookston: well drained, deep to moderately deep soil formed in loess overlying fan or terrace gravels

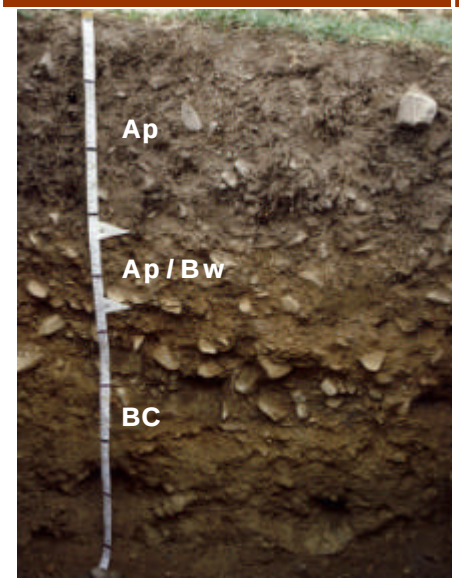
Similar soils

Some soils that have similar properties to Lintley soils are:

- Gore: shallow soil formed on low river terraces
- Berwen: a Pallic soil formed on shallow fan alluvium from schist
- Dome: shallow recent soil, forming on the floodplain on fans from greywacke

Typical profile features

The following is a 'generic' or composite profile description representing the most common combination of characteristics for this soil type. The actual profiles for which descriptions and data are available are listed at the end of this Technical Data Sheet.

Lintley profile	Horizon	Depth (cm)	Description
	Ap	0–26	Greyish yellow-brown slightly gravelly silt loam; weak soil strength; strongly developed extremely fine to fine polyhedral structure; gravels angular and slightly weathered; abundant roots
	Ap/Bw	26–42	Yellowish brown moderately gravelly silt loam; many worm casts; weak soil strength; strongly developed very fine to fine polyhedral structure; gravels angular and slightly weathered; abundant roots
	BC	42–90	Olive brown extremely gravelly sandy loam; gravels densely packed; massive structure; gravels angular and slightly weathered; few roots

Key profile features

Lintley soils have a topsoil 20–30cm deep, with strongly developed structure. Subsoils have a yellowish brown B horizon, with moderate to weak structure. Stones occur throughout the profile. Roots extend to about 50cm, but become limited by the extremely gravelly subsoil.

Typical physical properties

Note: values in Italics are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Ap	0–26	Moderate	*Rapid*	Silt loam	Slightly gravelly
Ap/Bw	26–42	—	*Rapid*	Silt loam	Moderately gravelly
BC	42–90	—	*Rapid*	Sandy loam	Extremely gravelly

Profile drainage: Well

Plant readily available water: *Moderate*

Potential rooting depth: Slightly deep

Rooting restriction: Extremely gravelly subsoil

Key physical properties

Lintley soils have a slightly deep rooting depth and moderate plant available water, restricted by the subsoil gravelliness. The soils have good aeration and permeability through the profile, and may be excessively so in the stony soils of the shallow phase. Texture is silt loam in all horizons, but becomes sandy in extremely gravelly horizons. Topsoil clay content is 25–30%. The gravelliness of the subsoil can vary, and the rooting depth and water-holding capacity will improve in the less gravelly soils. Typically there is at least 35% gravel within 45cm depth.

Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Ap	0–26	Moderate	Low	Moderate	Moderate	Moderate	Moderate	Very low	Low
Ap/Bw	26–42	Moderate	Moderate	Moderate	Low	Low	Very low	Very low	Low
BC	42–90	Moderate	Moderate	Moderate	Low	Very low	Low	Very low	Low

Key chemical properties

Topsoil organic matter levels are 6–7% and P-retention values 25–35%. pH vaues are moderate (5.8–6.1) in all horizons. Cation exchange and base saturation values are moderate. Available calcium and magnesium levels are moderate with potassium values low. Micronutrient levels are generally adequate, although molybdenum responses in legumes and boron responses in brassicas can be expected.

Vulnerability to environmental degradation

Note: the vulnerability ratings given in the table below are generalised and should not be taken as absolutes for this soil type in all situations. The actual risk depends on the environmental and management conditions prevailing at a particular place and time. Specialist advice should be sought before making management decisions that may have environmental impacts. Where vulnerability ratings of Moderate to Very severe are indicated, advice may be sought from Environment Southland or a farm management consultant.

Vulnerability factor	Rating	Vulnerability compared to other Southland soils
Structural compaction	moderate	These soils have a moderate vulnerability to structural degradation by long-term cultivation, or compaction by heavy stocking and vehicles. This rating reflects the good drainage, moderate clay, and organic matter levels.
Nutrient leaching	very severe	These soils have a very severe vulnerability to leaching to groundwater. This rating reflects the good drainage, moderate water holding capacity and rapid permeability. .
Topsoil erodibility by water	minimal	Due to the moderate clay and organic matter levels, topsoil erodibility in these soils is minimal. Erodibility is highly dependent on management, particularly when there is no vegetation cover.
Organic matter loss	moderate	Vulnerability to long-term decline in soil organic matter levels is partly dependent on soil properties and highly dependent on management practices (e.g., crop residue management and cultivation practices).
Waterlogging	nil	These soils have a nil vulnerability to waterlogging during wet periods. This rating reflects the good drainage, and permeability.

General landuse versatility ratings for Lintley soils

Note: The versatility ratings in the table below are indicative of the major limitations for semi-intensive to intensive landuse. These ratings differ from those used in the past in that sustainability factors are incorporated in the classification.

Refer to the Topoclimate district soil map or property soil map to determine which of the soil symbols listed below are applicable, then check the versatility ratings for that symbol in the appropriate table.

LiU3 (Lintley undulating shallow)
LiR3 (Lintley rolling shallow)

Versatility evaluation for soil LiU3, LiR3		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Limited	Vulnerability to leaching to groundwater; restricted rooting depth
Arable	Limited	Vulnerability to leaching to groundwater: restricted rooting depth.
Intensive pasture	Limited	Vulnerability to leaching to groundwater; restricted rooting depth.
Forestry	Limited	Restricted rooting depth

LiU3vi (Lintley undulating shallow imperfectly drained variant)

Versatility evaluation for soil LiU3vi		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Limited	Restricted rooting depth
Arable	Limited	Restricted rooting depth.
Intensive pasture	Limited	Restricted rooting depth.
Forestry	Limited	Restricted rooting depth

LiU2 (Lintley undulating moderately deep)

Versatility evaluation for soil LiU2		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Moderate	Vulnerability to leaching to groundwater; restricted rooting depth
Arable	Moderate	Vulnerability to topsoil structural degradation by cultivation and compaction; vulnerability to leaching to groundwater
Intensive pasture	Moderate	Vulnerability to topsoil structural degradation by cultivation and compaction; vulnerability to leaching to groundwater
Forestry	Moderate	Restricted rooting depth

Management practices that may improve soil versatility

- Management of nutrient applications so as to minimise leaching losses

Soil profiles available for Lintley soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
LiU3	B13	12	✓	✓	✓	✓
LiU2	B6	12	✓	✓	✓	✓
Liu3	FT4	15	✓	✓	✓	✓

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Crops for Southland
PO Box 1306, Invercargill. New Zealand

www.cropssouthland.co.nz