

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: Longridge

Overview

Longridge soils occupy about 2,400 ha in hollows and toe slopes of fans in northern Southland between Balfour and Athol and south of Tapanui in west Otago. They are formed into alluvial fan gravels mixed with a thin mantle of loess derived from greywacke. They are shallow, silty, poorly drained soils that have a high water table. Present use is pastoral grazing with sheep, beef cattle and deer. Climate is cool temperate with regular rain.

Soil classification

NZ Soil Classification (NZSC):

Typic Orthic Gley; angular-stony, hard sandstone; silty

Previous NZ Genetic Classification:

Intergrade between yellow-brown and yellow-grey earth.

Classification explanation

Longridge soils have been reclassified as the soils have properties more consistent with Gley soils rather than Brown soils. The soils are poorly drained due to a high groundwater table, and accumulation of sediment is sufficiently slow that subsoils show structural development. They have silty textures and are shallow, with less than 45cm to the gravels.

Soil phases and variants

Identified units in the Longridge soils are:

- Longridge undulating shallow (LnU3): has gravel within 45cm depth; occurs on slopes of 0–7°
- Longridge rolling shallow (LnR3): has gravel within 45cm depth; occurs on slopes of 7–15°
- Longridge hilly shallow (LnH3): has gravel within 45cm depth; occurs on slopes of 15–25°
- Londridge steep shallow (LnS3): has gravel within 45cm depth; occurs on slopes of >25°

The soil properties described in this Technical Data Sheet are based on the most common phase, Longridge undulating shallow (LnU3). 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., Longridge hilly shallow (LnH3).

Associated soils

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

- Jacobstown: moderately deep to deep poorly drained silty soils formed in alluvium on the floodplains of major streams.
- Makarewa: moderately deep to deep poorly drained clayey soils formed in alluvium on the floodplains of major streams.
- Glenure: moderately deep to deep poorly drained gley soils formed into loess on fans and terraces.
- Lintley: well drained shallow soil forming in fan gravels.

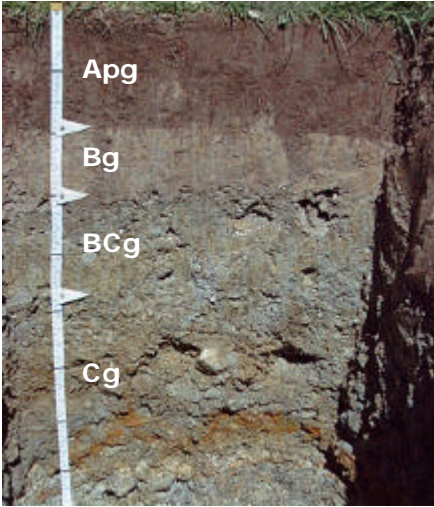
Similar soils

Some soils that have similar properties to Longridge soils are:

- Dipton: shallow, poorly drained soil due to water perching on clay-bound gravels of intermediate to high terraces.
- Lumsden: shallow, poorly drained soil of floodplains and low terraces; due to a high groundwater table
- Caroline: shallow to moderately deep poorly drained soil on low terraces; due to a high groundwater table, with a cemented ironpan

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.

Longridge profile	Horizon	Depth (cm)	Description
	Apg	0–19	Brownish grey silt loam; few light grey and orange mottles; weak soil strength; moderately developed extremely fine to fine and coarse polyhedral structure; gravels fresh and subangular; abundant roots
	Bg	19–30	Light grey silt loam; common orange mottles; few worm casts; slightly firm soil strength; moderately developed fine to coarse polyhedral structure; gravels fresh and subangular; many roots
	BCg	30–47	Light grey very gravelly silt loam; few orange mottles; weak soil strength; massive structure; gravels fresh and subangular; many roots
	Cg	47–90+	Light grey extremely gravelly clay loam; many light grey and common orange mottles; weak soil strength; massive structure; gravels fresh and subangular; common roots

Key profile features

Longridge soils have a topsoil 20–25cm deep with moderate to strong structure. Subsoil structure is moderate grading to structureless as the gravelliness increases. The dominance of grey colours throughout the subsoil reflects the poor drainage of the soils.

Typical physical properties

Note: values in *Italics* are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Apg	0–19	Moderate – High	<i>Moderate</i>	Silt loam	Very slightly gravelly
Bg	19–30	Moderate – High	<i>Slow</i>	Silt loam	Slightly gravelly
BCg	30–47	—	<i>Slow</i>	Silt loam	Very gravelly
Cg	47–90+	—	<i>Moderate</i>	Sandy loam	Extremely gravelly

Profile drainage: Poor
Plant readily available water: *Moderate*
Potential rooting depth: Slightly deep
Rooting restriction: Extremely gravelly subsoil

Key physical properties

Longridge soils have a slightly deep rooting depth and moderate plant available water that is limited by the subsoil gravelliness. Permeability is slow, with poor aeration due to the high water table. Textures are heavy silt loams to silty clay, grading to coarser loamy textures in the gravels. Topsoil clay content is 25–40% with a slight to moderate gravel content. Subsoils are very to extremely gravelly.

Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Apg	0–19	Moderate	Moderate	Moderate	High	High	Moderate	Low	Low
Bg	19–30	Moderate	Low	Moderate	High	Moderate	Moderate	Very low	Low
BCg	30–47	Moderate	Low	Low	High	Low	Moderate	Very low	Low

Key chemical properties

Topsoil organic matter levels vary between 5 and 12%; P-retention 20–30% and pH values moderate (high 5s). Subsoil pH values are about 6.0. Cation exchange values are moderate and base saturation high. Available calcium and magnesium levels are moderate and potassium low. Reserve phosphorus levels are also low. Micronutrient levels are generally adequate although molybdenum responses in legumes 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	severe	These soils have a severe vulnerability to structural degradation by long-term cultivation, or compaction by heavy stocking and vehicles. This rating reflects the poor drainage and low P-retention.
Nutrient leaching	moderate	These soils have a moderate vulnerability to leaching to groundwater. This rating reflects the moderate water holding capacity, offset by the slow permeability and poor drainage.
Topsoil erodibility by water	minimal	Due to the moderate to high clay content, topsoil erodibility in these soils is minimal. Erodibility is highly dependent on management, particularly when there is no vegetation cover.
Organic matter loss	severe	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	severe	These soils have a severe vulnerability to waterlogging during wet periods on undulating and rolling slopes with a moderate and slight rating on hilly and steep slopes respectively. This rating reflects the poor drainage and slow permeability.

General landuse versatility ratings for Longridge 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.

LnU3 (Longridge undulating shallow)

Versatility evaluation for soil LnU3		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Limited	Inadequate aeration during wet periods; restricted rooting depth
Arable	Limited	Inadequate aeration during wet periods; short-term waterlogging risk after heavy rain.
Intensive pasture	Limited	Short-term waterlogging risk after heavy rain.
Forestry	Limited	Inadequate aeration during wet periods; restricted rooting depth

LnR3 (Longridge rolling shallow)

Versatility evaluation for soil LnR3		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Limited	Inadequate aeration during wet periods; restricted rooting depth
Arable	Limited	Inadequate aeration during wet periods; rolling slopes
Intensive pasture	Limited	Short-term waterlogging risk after heavy rain.
Forestry	Limited	Inadequate aeration during wet periods; restricted rooting depth.

LnH3 (Longridge hilly shallow)

Versatility evaluation for soil LnH3		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Unsuitable	Hilly slopes
Arable	Unsuitable	Hilly slopes
Intensive pasture	Limited	Hilly slopes; short-term waterlogging risk after heavy rain.
Forestry	Limited	Inadequate aeration during wet periods; restricted rooting depth.

LnS3 (Longridge steep shallow)

Versatility evaluation for soil LnS3		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Unsuitable	Steep slopes
Arable	Unsuitable	Steep slopes
Intensive pasture	Limited	Steep slopes; short-term waterlogging risk after heavy rain.
Forestry	Limited	Steep slopes; restricted rooting depth.

Management practices that may improve soil versatility

- Careful management after heavy rain and wet periods will reduce the impact of short-term waterlogging. Intensive stocking, cultivation and heavy vehicular traffic use should be minimised during these periods.
- Installation of tile drains will reduce the risk of aeration limitations and short-term waterlogging.

Soil profiles available for Longridge soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
LnU3	FT3	15	✓	✓	✓	✓
LnU3	B1	12	✓	✓	✓	✓
LnU3	B11	12	✓	✓	✓	✓
LnU3	TT8	23	✓	✓	✓	✓

Published by Crops for Southland with financial support from Environment Southland.

Copyright © 2002, Crops for Southland

This Technical Data Sheet may be reproduced in whole or in part and in any form for educational or non-profit purposes without special permission from the copyright holder, provided acknowledgement of the source is made. Crops for Southland and Environment Southland would appreciate receiving a copy of any publication that uses this Technical Data Sheet as a source.

No use of this Technical Data Sheet may be made for resale or for any other commercial purpose whatsoever without prior permission in writing from Crops for Southland.

Crops for Southland
PO Box 1306, Invercargill. New Zealand



www.cropssouthland.co.nz