

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: Hedgehope

Overview

Hedgehope soils occupy about 600 ha on floodplain levees and low terraces of Hedgehope, Otapiri, Makarewa and other streams draining the Hokonui Hills. They are formed in deep to moderately deep fine alluvium from tuffaceous greywacke. Soils are well to imperfectly drained, with deep rooting depth, moderately high plant available water, and silty to loamy textures. Present use is pastoral farming with sheep, dairy and beef cattle. Climate is cool temperate with regular rain throughout the year. Soils rarely dry out.

Soil classification

NZ Soil Classification (NZSC):

Typic Orthic Brown; stoneless; silty.

Previous NZ Genetic Classification:

Gley Recent

Classification explanation

The NZSC of Hedgehope soils differs from the previous classification, as the good drainage and subsoil development means the soils are more similar to Brown soils rather than Recent or gley soils. They are typically moderately well drained soils, with no major rooting barrier in the subsoil. The soils are typically stone free, with dominantly silty texture.

Soil phases and variants

Identified units in the Hedgehope soils are:

- Hedgehope undulating deep (HgU1): has no stones within 90cm depth; occurs on slopes of 0–7°
- Hedgehope undulating deep, imperfect drained variant (HgU1vi): is imperfectly drained; has no stones within 90cm depth; occurs on slopes of 0–7°
- Hedgehope undulating moderately deep (HgU2): has gravel between 45 and 90 cm depth; occurs on slopes of 0–7°

The soil properties described in this Technical Data Sheet are based on the most common phase, Hedgehope undulating deep (HgU1). 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., Hedgehope undulating deep imperfectly drained variant (HgU1vi).

Associated soils

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

- Makarewa: poorly drained soil on the floodplain; has clayey textures
- Pukemutu: is poorly drained due to water perching on a subsoil fragipan
- Tisbury: poorly drained soil on terraces

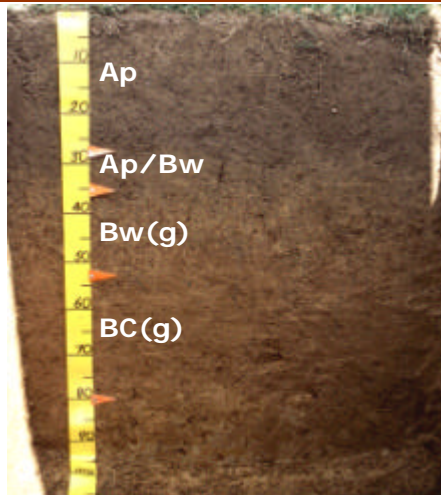
Similar soils

Some soils that have similar properties to Hedgehope soils are:

- Nithdale: very similar soil that occurs on floodplains and low terraces adjacent to minor streams in the Kaiwera to Waikawa districts; typically has acidic subsoils
- Niagara: imperfectly drained equivalent of the Nithdale soil
- Ardlussa: occurs on floodplains and low terraces of streams and rivers in northern Southland and west Otago; not as strongly weathered as the Hedgehope, with Pallic to Brown intergrade properties

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.

Hedgehope profile	Horizon	Depth (cm)	Description
	Ap	0–28	Greyish yellow brown silt loam; weak soil strength; moderately developed very fine polyhedral structure; many roots.
	Ap/Bw	28–35	Dull yellowish brown silt loam; abundant wormcasts; weak soil strength; moderately developed very fine polyhedral structure; common roots.
	Bw(g)	35–53	Dull yellowish brown silt loam; few dull yellow orange mottles; few wormcasts; weak soil strength; moderately developed very fine polyhedral structure; few roots.
	BC(g)	53–90	Dull brown silt loam; few greyish yellow mottles; very few wormcasts; slightly firm soil strength; moderately developed fine polyhedral structure; few roots.
	BC(g)	53–90	Dull brown silt loam; few greyish yellow mottles; very few wormcasts; slightly firm soil strength; moderately developed fine polyhedral structure; few roots.

Key profile features

Hedgehope topsoils are variable in depth (20–35cm), and have moderately developed structure. Subsoils also have moderate structure or are only weakly compacted, root distribution is good. The yellow-brown colours of the subsoil reflect the weathered B horizon that is typical of these soils.

Typical physical properties

Note: values in *Italics* are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Ap	0–28	Moderate – High	<i>Moderate</i>	Silt loam	Gravel free
Ap/Bw	28–35	Moderate – High	<i>Moderate</i>	Silt loam	Gravel free
Bw(g)	35–53	Moderate – High	<i>Moderate</i>	Silt loam	Gravel free
BC(g)	53–90	Moderate – High	<i>Slow</i>	Silt loam	Gravel free

Profile drainage:	Moderately well
Plant readily available water:	<i>Moderately high</i>
Potential rooting depth:	Deep
Rooting restriction:	High water table and wet soils

Key physical properties

Hedgehope soils have a deep rooting depth, moderately high plant available water and no major restriction to root growth. The soils are well to moderately well aerated, but have slow permeability in the lower subsoil. Horizon texture is typically heavy silt loam, but may contain contrasting layers of silty clay to sandy loam texture. Topsoil clay content is 20–35%. The deep phases are stoneless, with the moderately deep phase having gravel below 45cm depth.

Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Ap	0–28	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Low
Ap/Bw	28–35	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Low	Low
Bw(g)	35–53	Moderate	Moderate	Moderate	Moderate	Low	Low	Low	Low
BC(g)	53–90	Moderate	Moderate	Moderate	Low	Low	Low	Very low	Low

Key chemical properties

Topsoil organic matter values are about 5–8%; P-retention values 40% and topsoil pH levels moderate (high 5s). Subsoil pH levels can be low (low 5s). Cation exchange and base saturation levels are moderate. Available calcium and magnesium levels are moderate with potassium levels low. Soil reserve phosphorus levels are low. Micronutrient levels are generally adequate.

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	slight	These soils have a slight vulnerability to structural degradation by long-term cultivation, or compaction by heavy stocking and vehicles. This rating reflects the moderately well to well drained character of the soil and the moderate organic matter content and P-retention.
Nutrient leaching	moderate	These soils have a moderate vulnerability to leaching to groundwater. This rating reflects the moderately well drained character of this soil, offset by the high water-holding capacity.
Topsoil erodibility by water	slight	Due to the moderate clay and organic matter content, topsoil erodibility in these soils is slight. Erodibility is highly dependent on management, particularly when there is no vegetation cover.
Organic matter loss	minimal	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	moderate	These soils have a moderate vulnerability to waterlogging during wet periods. This rating reflects the good drainage, but slow permeability of the subsoil. The imperfectly drained variant has a severe waterlogging vulnerability because of its poorer drainage status.

General landuse versatility ratings for Hedgehope 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.

HgU1 (Hedgehope undulating deep)

HgU2 (Hedgehope undulating moderately deep)

Versatility evaluation for soil HgU1, HgU2		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Moderate	Risk of short-term waterlogging after heavy rain; potential flood risk.
Arable	Moderate	Risk of short-term waterlogging after heavy rain.
Intensive pasture	Moderate	Vulnerability to leaching to groundwater; vulnerability to sustained waterlogging.
Forestry	Limited	Potential flood risk.

HgU1vi (Hedgehope undulating deep, imperfectly drained variant)

Versatility evaluation for soil HgU1vi		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Moderate	Inadequate aeration during wet periods; potential flood risk
Arable	Moderate	Inadequate aeration during wet periods; risk of short-term waterlogging after heavy rain.
Intensive pasture	Moderate	Vulnerability to leaching to groundwater; vulnerability to sustained waterlogging.
Forestry	Limited	Potential flood risk.

Management practices that may improve soil versatility

- Careful management after heavy rain or 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 and maintenance of subsurface mole and tile drains will reduce the risk of short-term waterlogging.
- Careful management of nutrients to minimise leaching.

Soil profiles available for Hedgehope soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
HgU1	CT2	6	✓	✓	✓	✓
HgU1	SB7693	14	✓	✓	✓	

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