

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: Ohai

Overview

Ohai soils occupy about 5,400 ha on rolling and hilly slopes in the Birchwood/Ohai districts of western Southland. They are formed in fine colluvium or *in situ* weathered coal measure mudstone. Ohai soils have poor drainage, deep rooting depth, moderate water-holding capacity, and clayey textures through the profile. Present use is pastoral grazing with sheep, beef cattle and some deer. Climate is cool temperate with regular rain.

Soil classification

NZ Soil Classification (NZSC): Argillic Perched-gley Pallic; stoneless; clayey

Previous NZ Genetic Classification: Moderately gleyed yellow-grey earth.

Classification explanation

The NZSC of the Ohai soil is consistent with the previous classification. Ohai soils are poorly drained, due to perching of water on a slowly permeable subsoil layer. The soils typically have clayey textures throughout, but the lower subsoil is typically more clayey due to the accumulation of clay. The soils typically are stone free.

Soil phases and variants

Identified units in the Ohai soils are:

- Ohai rolling deep (OhR1): has no gravel within 90cm depth; occurs on slopes of 7–15°
- Ohai hilly deep (OhH1): has no gravel within 90cm depth; occurs on slopes of 15–25°
- Ohai undulating deep (OhU1): has no gravel within 90cm depth; occurs on slopes of 0–7°

The soil properties described in this Technical Data Sheet are based on the most common phase, Ohai rolling deep (OhR1). 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., Ohai hilly deep (OhH1).

Associated soils

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

- Mossburn: poorly drained, silty textured soil, with a fragipan; formed in loess
- Aparima: imperfectly drained Brown soil, with a fragipan; formed in loess
- Otikerama: well drained, shallow soil formed in old terrace gravels
- Makarewa: poorly drained, clayey soil on floodplains

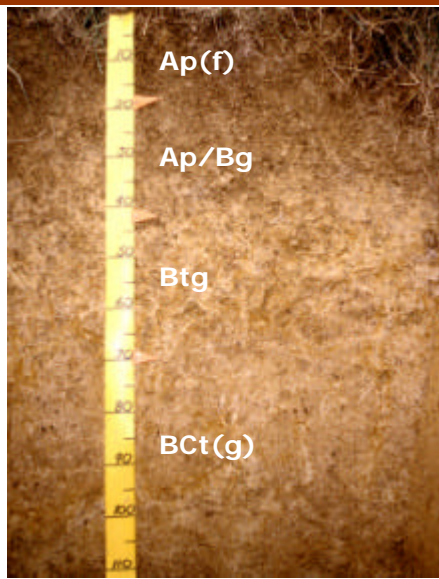
Similar soils

Some soils that have similar properties to Ohai soils are:

- Hokonui: formed in mixed loess and fine colluvium from tuffaceous argillite
- Pukemutu: formed in loess, with a fragipan; has silty topsoils and clayey textured subsoils
- Mangapiri: formed in fine colluvium from siltstone and mudstone as well as colluvium from weathered terrace gravels

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.

Ohai profile	Horizon	Depth (cm)	Description
	Ap(f)	0–21	Dull yellowish brown clay; few yellowish brown mottles; slightly firm soil strength; moderately developed very fine to coarse polyhedral structure; abundant roots
	Ap/Bg	21–45	Greyish yellow clay; many dull yellow orange and common yellowish brown mottles; common light yellow clay coats; common worm casts; slightly firm soil strength; moderately developed very fine to coarse polyhedral structure; common roots
	Btg	45–71	Light grey clay; abundant orange mottles; many light yellow clay coats; few worm casts; slightly firm soil strength; moderately developed fine blocky and medium to coarse prismatic structure; common roots
	Bct(g)	71–90+	Dull yellowish brown silty clay; abundant greyish yellow and few bright brown mottles; many light yellow clay coats; weak soil strength; moderately developed coarse polyhedral and medium to coarse prismatic structure; few roots.

Key profile features

Hokonui soils have a 15–20cm deep topsoil with moderately developed structure. Subsoil structure is weakly to moderately developed. Grey colours are dominant in the upper subsoil, with the lower subsoil commonly having a yellow-brown perching layer.

Typical physical properties

Note: values in *Italics* are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Ap(f)	0–21	Moderate	<i>Moderate</i>	Clay	Gravel free
Ap/Bg	21–45	Moderate – High	<i>Slow</i>	Clay	Gravel free
Btg	45–71	Moderate – High	<i>Slow</i>	Clay	Gravel free
BCt(g)	71–90+	Moderate – High	<i>Slow</i>	Silty clay	Gravel free

Profile drainage: Poor

Plant readily available water: *Moderate*

Potential rooting depth: Deep

Rooting restriction: Some soils may have high density in the lower subsoil

Key physical properties

Ohai soils have moderate plant available water and a deep rooting depth, that may be limited in some soils by the high bulk density in the lower subsoil. The rooting depth may also be limited by poor aeration during wet periods due to the poor drainage and slow subsoil permeability. Textures are silty clay to clay throughout. Topsoil clay content is 40–60%. The soils are typically stone free.

Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Ap(f)	0–21	Low	Moderate	High	Low	Low	High	High	Low
Ap/Bg	21–45	Low	High	High	Very	Low	High	Medium	Low
Btg	45–71	Low	High	High	Very	Low	High	Low	Low
BCt(g)	71–90+	Low	High	High	Low	Low	High	Low	Low

Key chemical properties

Topsoil organic matter levels are about 7–8%; P-retention 60% and pH values low in all horizons. Cation exchange is high and base saturation low. Available calcium levels are low and magnesium and potassium values high. Reserve phosphorus levels are low. Micronutrient levels are generally adequate although boron responses in brassicas and molybdenum responses in legumes can occur.

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	minimal	These soils have minimal vulnerability to structural degradation by long-term cultivation, or compaction by heavy stocking and vehicles. This rating reflects the poor drainage, offset by the high clay content and moderate P-retention.
Nutrient leaching	slight	These soils have a slight vulnerability to leaching to groundwater. This rating reflects the poor drainage and slow permeability, offset by the moderate water-holding capacity.
Topsoil erodibility by water	minimal	Due to the high clay content and moderate organic matter level, 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	severe	These soils have a severe vulnerability to waterlogging during wet periods. This rating reflects the poor drainage and slow permeability. The hilly phases will have a lower vulnerability.

General landuse versatility ratings for Ohai 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.

OhR1 (Ohai rolling deep)

Versatility evaluation for soil OhR1		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Limited	Inadequate aeration during wet periods; risk of short-term waterlogging after heavy rain.
Arable	Limited	Inadequate aeration during wet periods; rolling slopes.
Intensive pasture	Limited	Risk of short-term water logging after heavy rain.
Forestry	Limited	Inadequate aeration during wet periods; vulnerability to sustained waterlogging.

OhU1 (Ohai undulating deep)

Versatility evaluation for soil OhU1		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Limited	Inadequate aeration during wet periods; risk of short-term waterlogging after heavy rain.
Arable	Limited	Inadequate aeration during wet periods; risk of short-term waterlogging after heavy rain.
Intensive pasture	Limited	Risk of short-term waterlogging after heavy rain.
Forestry	Limited	Inadequate aeration during wet periods; vulnerability to sustained waterlogging.

OhH1 (Ohai hilly deep)

Versatility evaluation for soil OhH1		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Unsuitable	Hilly slopes
Arable	Unsuitable	Hilly slopes
Intensive pasture	Limited	Risk of short-term waterlogging after heavy rain; hilly slopes
Forestry	Limited	Inadequate aeration during wet periods.

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 and maintenance of sub-surface mole and tile drains will reduce the risk of short-term waterlogging.

Soil profiles available for Ohai soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
OhU1	ONT5	25	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
OhU1	168/75/5	25	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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