

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: **Otanomomo**

Overview

Otanomomo soils occupy about 14,300 ha scattered throughout the lowlands of Southland. They are peat soils formed in weakly to moderately decomposed organic material. Otanomomo soils typically occur as raised bogs (up to 6m deep) overlaying fine alluvium and gravel, and the peat bogs vary in size from a few metres across to hundreds of hectares. The soils have very poor drainage and are extremely acid, which severely restricts the growth of most crops. Many peat swamps have only been developed around the edges, with areas of deeper peat partially or not developed, and are now used for casual pastoral grazing or are included in the conservation estate. Climate varies according to location.

Soil classification

NZ Soil Classification (NZSC):

Sphagnic Fibric Organic; deep, mossy; peat

Previous NZ Genetic Classification:

Organic soils

Classification explanation

The NZSC of Otanomomo soils is consistent with the previous classification. The soils are formed in very poorly drained deep peat that contains an organic matter content of at least 30%. The peat shows only weak to moderate decomposition, and the fibrous plant material of species such as Sphagnum moss are easily recognisable.

Soil phases and variants

Identified units in the Otanomomo soils are:

- Otanomomo undulating deep (OnU1): has no gravel within 90cm; occurs on slopes of 0-7°
- Otanomomo undulating moderately deep (OnU2): has gravel between 45 and 90cm; occurs on slopes of 0-7°
- Otanomomo undulating deep mineral subsoil variant (OnU1vm): has no gravel within 90cm, but has a mineral subsoil between 30-50cm depth; occurs on slopes of 0-7°

The soil properties described in this Technical Data Sheet are based on the most common phase, Otanomomo undulating deep (OnU1). Values for other phases and variants can be taken as being similar.

Associated soils

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

- Te Anau: well drained, shallow moraine soils that, together with Monowai soils, are associated with Otanomomo soils in the Te Anau Basin.
- Pukemutu: poorly drained soils with a fragipan formed in deep loess on the Southland Plain
- Tisbury: poorly drained soil formed in deep loess on the Southland Plain

- Mokotua: imperfectly drained soil formed in deep loess on the Southland Plain.
- Tiwai and Kapuka: shallow to moderately deep podzolised soils forming on marine terraces in the lower Southland Plain.

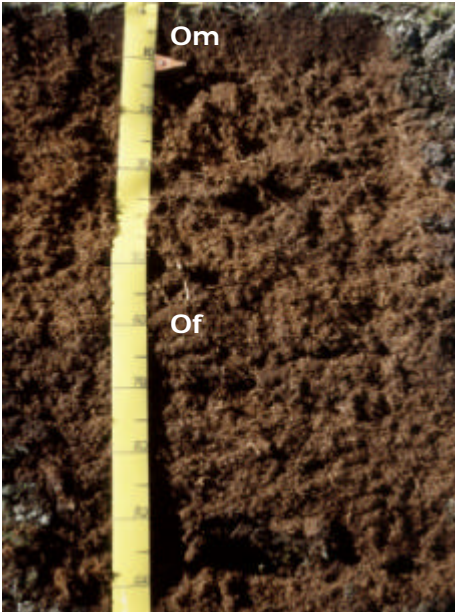
Similar soils

Some soils that have similar properties to Otanomomo soils are:

- Andrews: very similar weakly decomposed peat; formed from plant materials that have a minor moss component
- Invercargill: commonly occur as basin peats, and the organic material is strongly decomposed
- Colac: moderately decomposed basin peat formed on marine terraces adjacent to Colac Bay
- Titipua: has a peaty topsoil, but the organic content is between 18-30%, and is not high enough to meet the requirements of Organic soils.

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.

Otanomomo profile	Horizon	Depth (cm)	Description
	Om	0-10	Dark reddish brown moderately decomposed peat; very weak soil strength; structureless; common roots
	Of	10-90	Brown undecomposed fibrous spagnum peat; very weak soil strength; structureless; few roots

Key profile features

Otanomomo soils typically have no topsoil, although developed peats under pasture do show 10-30cm of peaty textured topsoil development. The profile as a whole is dominated by dark coloured weakly decomposed fibrous organic material. Tree roots and branches are also commonly buried throughout the soil.

Typical physical properties

Note: values in *Italics> are estimates*

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Om	0-10	Very Low	—	Peat	Gravel free
Of	10-90	Very Low	—	Peat	Gravel free

Profile drainage: Very poor

Plant readily available water: *Moderately high*

Potential rooting depth: Shallow

Rooting restriction: Very poor aeration and extreme acidity.

Key physical properties

Otanomomo soils in the natural state have shallow rooting depth that is limited by the very poor aeration and extremely acid subsoils. Soils that have been developed will have deeper rooting depth, depending on the degree to which the aeration and acidity have been improved. Otanomomo soils have moderately high plant available water and very low bulk densities. The texture is dominated by organic material, and the texture of the mineral fraction varies with a clay content of 30-50%. Stones and gravel are absent except in moderately deep soil where they occur below 45cm.

Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Om	0-10	Very low	Very low	Very low	Very low	Low	Low	Low	High
Of	10-90	Very low	Very low	Very high	Very low	Low	Low	Low	High

Key chemical properties

Organic matter levels are greater than 30%, and most typically 50-90%; P-retention values and pH values are very low (<4.9). Cation exchange is very high, reflecting the organic matter content, but the base saturation is low. Available cations vary, with low values in many locations. Reserves of phosphorus and sulphur are also very low as are micro-nutrient levels.

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 a minimal vulnerability to structural degradation by long-term cultivation, or compaction by heavy stocking and vehicles. This rating reflects the very high organic matter levels.
Nutrient leaching	slight	These soils have a slight vulnerability to leaching to groundwater. This rating reflects the very poor drainage and water holding capacity.
Topsoil erodibility by water	minimal	Due to the high organic matter content, the topsoil erodibility of these soils is minimal. 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). Soils that have been drained will initially have a very severe vulnerability.
Waterlogging	severe	These soils have a severe vulnerability to waterlogging during wet periods. This rating reflects the very poor drainage.

General landuse versatility ratings for Otonomomo soils

Note: The versatility ratings in the table below are indicative of the major limitations for semi-intensive to intensive land use. 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.

OnU1 (Otonomomo undulating deep)

OnU2 (Otonomomo undulating moderately deep)

OnU1vm (Otonomomo undulating deep mineral subsoil variant)

Versatility evaluation for soil OnU1, OnU2, OnU1vm		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Unsuitable	Restricted rooting depth; vulnerability to sustained waterlogging
Arable	Unsuitable	Restricted rooting depth; vulnerability to sustained waterlogging
Intensive pasture	Unsuitable	Restricted rooting depth; vulnerability to sustained waterlogging
Forestry	Unsuitable	Restricted rooting depth; vulnerability to sustained waterlogging

Management practices that may improve soil versatility

- Installation and maintenance of drainage ditches
- Liming to raise the soil pH

Soil profiles available for Otanomomo soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
OnU1	MWT6	28B	✓	✓	✓	✓
OnU1	LT9	41	✓	✓	✓	✓
OnU1	PT01	38	✓	✓	✓	✓
oNu1	PT12	38	✓	✓	✓	✓
OnU1	ST11	29	✓	✓	✓	✓
OnU1	TT12	23	✓	✓	✓	✓
OnU1	XT10	13	✓	✓	✓	✓
ONU1	SB7698	6	✓	✓	✓	

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

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