

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.



Otanomomo profile

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.

Fertility 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.

Associated and similar 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.

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.

Sustainable management indicators

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

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 (Otanomomo undulating deep)

OnU2 (Otanomomo undulating moderately deep)

OnU1vm (Otanomomo 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