

This Information 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. Advice 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.
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Soil name: Otarai

Overview

Otarai soils occupy about 15,000 ha on rolling downs and hills in the Kaiwera district of eastern Southland and in southern Southland. They are formed into loess derived from schist, greywacke and tuffaceous greywacke. Otarai soils are well drained and have a deep rooting depth, high water holding capacity, heavy silt loam textures and P-retention of 40–85%. Present use is pastoral grazing with sheep, beef cattle and deer. Climate is cool temperate with regular rain during the year.

Physical properties

Otarai soils have a deep rooting depth and high plant available water, meaning there is no major physical barrier to root growth. The soils are well drained but the compact subsoil is slowly permeable, which may cause short-term waterlogging after heavy rainfall. Texture is heavy silt loam in all horizons, and some horizons may be silty clay. The topsoil clay content is about 25–35%, and the soils are typically stone free.



Otarai profile

Fertility properties

Topsoil organic matter levels are 6–8%; P-retention values 30–70% and pH levels low–moderate (low–mid 5s). Cation exchange values are moderate with base saturation low. Available calcium, magnesium and potassium levels are low, as is reserve phosphorus. Subsoils have high levels of sulphate sulphur. Molybdenum responses in legumes and boron responses in brassicas can be expected.

Associated and similar soils

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

- Kaiwera: strongly leached shallow Brown soil formed in gravelly colluvium; P-retention of >85%
- Kuriwao: moderately leached, shallow Brown soil formed in gravelly colluvium; P-retention of 60–85%
- Craigdale: moderately leached, moderately deep Brown soil formed in loess overlying bedrock
- Haldane: imperfectly drained, deep Brown soil; occurs in complexes with strongly leached soils south of Waimahaka

Some soils that have similar properties to Otarai soils are:

- Tokanui: very similar soil, but occurs in hilly and rolling land east of the Mataura River, south of Mataura; does not have acidic subsoils
- Ferndale: imperfectly drained equivalent of the Otarai soil
- Rosemarkie: strongly leached upland equivalent of the Otarai soil; has P-retention of >85%
- Tuturau: occurs in near-source loess adjacent to the Mataura river north of Waimahaka; has loamy silt textures in the subsoil

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	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 good drainage, and the topsoil clay and P-retention values.
Nutrient leaching	moderate	These soils have a moderate vulnerability to leaching to groundwater. This rating reflects the high water-holding capacity and slow subsoil permeability.
Topsoil erodibility by water	slight	Due to the moderate to high clay 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	slight	These soils have a slight vulnerability to waterlogging during wet periods. This rating reflects the good drainage, but slowly permeable subsoil.

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.

OrR1 (Otarua rolling deep)

Versatility evaluation for soil OrR1		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Moderate	Rolling slopes; risk of short-term waterlogging after heavy rain
Arable	Limited	Rolling slopes
Intensive pasture	Moderate	Vulnerability to leaching to groundwater; risk of short-term waterlogging after heavy rain
Forestry	High	Few limitations

OrU1 (Otarua undulating deep): without the limitation of rolling slope, the versatility rating for arable landuse improves to 'moderate'. Ratings for other landuses as for OrR1 above, but waterlogging replaces slope as the main limitation for non-arable horticulture and arable landuse.

OrR2 (Otarua rolling moderately deep): as for OrR1, but restricted rooting depth becomes a limitation for non-arable horticulture and for forestry, the versatility rating for the latter being only moderate.

OrU2 (Otarua undulating moderately deep): moderate versatility for all landuses. Main limitations are short-term waterlogging for non-arable horticulture and arable, restricted rooting dept for non-arable horticulture and forestry, leaching and waterlogging for intensive pasture.

OrH1 (Otarua hilly deep); OrH2 (Otarua hilly moderately deep): unsuitable for non-arable horticulture and arable landuse, and limited versatility for intensive pasture, due to hilly slopes; moderate versatility for forestry due to hilly slopes and to restricted rooting depth on moderately deep soils.

OrS1 (Otarua steep deep): Unsuitable for non-arable horticulture and arable landuse, and limited versatility for intensive pasture and forestry, due to steep slopes.

Management practices that may improve soil versatility

- Careful management after heavy rain and wet periods will reduce the risk of short-term waterlogging. Intensive s tocking, cultivation and heavy vehicular traffic should be minimised during these periods.
- Installation and maintenance of subsurface mole and tile drains on flatter terrain will reduce the risk of short-term waterlogging.
- If compaction occurs, aeration at the correct depth and moisture content can be of benefit.

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