

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.  
No warranties are expressed or implied unless stated.

## Soil name: Mararoa

### Overview

Mararoa soils occupy about 1100 ha on intermediate terraces and low fans in the Mararoa and upper Waiiau valleys. They are formed into moderately deep to deep loess over alluvial greywacke and basic volcanic gravels. Mararoa soils are well drained, moderately deep to deep soils, with moderate plant available water and silt loam to silty clay textures. They are currently used for pastoral grazing with sheep and beef cattle. Climate is cool temperate with cold winters and occasional dry summers.

### Physical properties

Mararoa soils have a moderately deep rooting depth and moderate plant available water, that is limited by the graveliness of the lower subsoil. The soils have good aeration and moderate permeability, but the imperfectly drained variant will not have as good properties. Textures are typically silt loams, with a clayey variant occurring in complexes in some locations. Topsoil clay content is 25–40%. Gravels are present below 45cm in moderately deep phases. Deep phases are stonefree, with deep rooting depth and moderately high plant available water.



*Mararoa profile*

### Fertility properties

Topsoil organic matter levels are 9–11%; P-retention 60–70% and pH moderate (high 5s). Cation exchange is high and base saturation moderate. Available calcium is high with magnesium and potassium levels very low. Reserve phosphorus and sulphur levels are also low. Micronutrient levels are generally adequate.

### Associated and similar soils

Some soils that commonly occur in association with **Error! Reference source not found.** soils are:

- Monowai: shallow, stony soil formed on glacial outwash terraces; strongly leached, with P-retention consistently above 85%
- Glenelg: shallow, stony soil formed on alluvial terraces from the Takitimu Mountains; moderately to strongly leached, with P-retention between 30 and 85%
- Waituna: shallow, stony soil formed on young fans from the Takitimu Mountains

Some soils that have similar properties to **Error! Reference source not found.** soils are:

- Princhester: has higher P-retentions (above 85%).
- Excelsior: has higher P-retentions (above 85%); also has a fragipan
- Freestone: similar profile but has sandy loam textures

## 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
<b>Structural compaction</b>	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 good drainage, and moderate to high P-retention and organic matter levels.
<b>Nutrient leaching</b>	severe	These soils have a severe vulnerability to leaching to groundwater. This rating reflects the good drainage, moderate water-holding capacity and permeability. The deep phases have moderate vulnerability.
<b>Topsoil erodibility by water</b>	slight	Due to the high organic matter levels and 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.
<b>Organic matter loss</b>	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).
<b>Waterlogging</b>	slight	These soils have a slight vulnerability to waterlogging during wet periods. This rating reflects the good drainage and permeability.

## 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.

### MrU2 (Mararoa undulating moderately deep)

#### MrU2vc (Mararoa undulating moderately deep, clayey variant)

Versatility evaluation for soil MrU2, MrU2vc		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Moderate	Vulnerability to nutrient leaching to groundwater; restricted rooting depth
Arable	High	Few limitations
Intensive pasture	Moderate	Vulnerability to nutrient leaching to groundwater
Forestry	Moderate	Restricted rooting depth

### MrU1 (Mararoa undulating deep)

#### MrU1vc (Mararoa undulating deep, clayey variant)

Versatility evaluation for soil MrU1, MrU1vc		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	High	Few limitations
Arable	High	Few limitations
Intensive pasture	Moderate	Vulnerability to nutrient leaching to groundwater
Forestry	High	Few limitations

**MrU1vi (Mararoa undulating deep imperfectly drained variant):** Versatility rating for non-arable horticulture and arable landuse is only moderate, with limitations of inadequate aeration during wet periods and risk of short-term waterlogging after heavy rain. Intensive pasture landuse (moderate versatility) is also vulnerable to sustained waterlogging. There are few limitations to forestry landuse, which has a high versatility rating.

### Management practices that may improve soil versatility

- Management of nutrient applications so as to minimise leaching losses

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