

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: **Wairaki**

Overview

Wairaki soils occupy about 1,800 ha on dissected, high, sloping terraces on the flanks of the northern and western slopes of the Takitimu Mountains in western Southland. They are formed into shallow loess overlying moderately to strongly weathered gravelly alluvium derived from tuffaceous greywacke and basic volcanic rocks. Soils are shallow to moderately deep, with moderate plant available water, moderately well to well drained, and have heavy silt loam to silty clay textures. Present use is pastoral farming with sheep, beef cattle and deer. Climate is temperate with cold winters. Regular rain occurs though some years can be seasonally dry.



Wairaki profile

Physical properties

Wairaki soils have a moderately deep rooting depth, and moderate plant available water, that is limited by the gravelliness of the lower subsoil. Aeration and permeability are moderate, but the strongly weathered soils typically have clay bound gravels and are likely to be slowly permeable. Textures are heavy silt loams to silty clay, with the topsoil clay content of 35–50%. Topsoils are commonly slightly gravelly with very gravelly horizons occurring within 45cm depth.

Fertility properties

Topsoil organic matter levels are 7–10%; P-retention 40–55% and pH moderate (high 5s). Cation exchange and base saturation levels are high. Available calcium, magnesium and potassium values are all high. Soil reserve phosphorus and sulphur levels are low. Micronutrient levels are generally adequate.

Associated and similar soils

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

- Sobig: moderately deep to shallow soil formed in loess overlying gravels
- Excelsior: deep well drained Brown soil, with a subsoil fragipan
- Mangapiri: poorly drained deep soil formed from mixed loess and mudstone
- Otanomomo: very poorly drained peat soils

Some soils that have similar properties to Wairaki soils are:

- Kaweku: occurs on high terraces of the Waimea plain; formed into moderately weathered mixed greywacke and schist gravels
- Benio: strongly weathered and leached soil, occurs on high terraces of the Waimea plain and in downlands northeast of Gore; formed into strongly weathered mixed greywacke, schist and quartz gravels
- Oteramika: occur on shoulder and sideslopes across the Southland plain; formed into moderately to strongly weathered mixed greywacke, schist, and quartz gravels.

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 good drainage, and moderate to high clay, P-retention, and organic matter content.
Nutrient leaching	severe	These soils have a severe vulnerability to leaching to groundwater. This rating reflects the good drainage and permeability.
Topsoil erodibility by water	slight	Due to the moderate to high clay and organic matter content, topsoil erodibility in these soils is slight. 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	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.

YKU3 (Wairaki undulating shallow)

Versatility evaluation for soil YkU3		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Moderate	Vulnerability to leaching to groundwater; restricted rooting depth
Arable	Moderate	Vulnerability to leaching to groundwater
Intensive pasture	Moderate	Vulnerability to leaching to groundwater
Forestry	Moderate	Restricted rooting depth.

YKR3 (Wairaki rolling shallow): as above, but limited versatility for arable landuse due to rolling slopes and restricted rooting depth; slope also becomes a limitation for intensive pasture.

YkH3 (Wairaki hilly shallow): hilly slopes make this phase unsuitable for non-arable horticulture and arable landuse, of limited versatility for intensive pasture and moderately versatile for forestry, where restricted rooting depth is also a limitation.

YKS3 (Wairaki steep shallow): steep slopes make this phase unsuitable for non-arable horticulture and arable landuse and of limited versatility for intensive pasture and forestry.

YKU2 (Wairaki undulating moderately deep)

Versatility evaluation for soil YkU2		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Moderate	Vulnerability to leaching to groundwater
Arable	Moderate	Vulnerability to leaching to groundwater
Intensive pasture	Moderate	Vulnerability to leaching to groundwater
Forestry	High	No major limitations

Management practices that may improve soil versatility

- Management of nutrient applications so as to minimise leaching losses