

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: Pukerau

### Overview

Pukerau soils occupy about 2,300 ha on rolling to hilly land in northern and eastern Southland, and in south Otago. The soils occur above about 300m in the Kaiwera area, lowering to above 100m in the Tokonui area. They are formed into thin loess overlying tuffaceous greywacke bedrock. These soils are well drained, have a shallow rooting depth, with moderate to high plant available water depending on the depth to the bedrock. They have heavy silt loam textures and have a P-retention of >85%. Present use is extensive grazing with sheep and beef cattle and forestry. Climate is cool with prevailing west to southwest winds because of the exposed position. Regular rainfall occurs and soils seldom dry out.



*Pukerau profile*

### Physical properties

Pukerau soils have a shallow rooting depth, restricted by the graveliness and bedrock in the subsoil, but moderate to high plant available water. These soils are well drained, with good aeration and permeability throughout the soil. Textures vary between heavy silt loam and silty clay, with topsoil clay content of 30–50%. The soils are gravelly throughout, and typically have at least 35% gravel within 45cm depth. Bedrock also typically occurs within 45cm depth

### Fertility properties

Topsoil organic matter levels are about 12–18%. P-retention >85% and pH moderate (low–mid 5s). Cation exchange is very high and base saturation low. Available calcium and magnesium levels are moderate and potassium levels low. Micronutrient levels are generally adequate although sheep may require supplementary cobalt and deer and cattle supplementary copper.

### Associated and similar soils

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

- Otaraiā: deep, well drained Brown soil with P-retention of 40–85% and pH of <5.5
- Tokanui: deep, well drained Brown soil with P-retention of 40–85%
- Haldane: deep, imperfectly drained Brown soil with pH of <5.5
- Rosemarkie: strongly leached upland equivalent of the Otaraiā soil; has P-retention of >85%

Some soils that have similar properties to Pukerau soils are:

- Venlaw: shallow Allophanic soil, formed in gravelly colluvium
- Kaiwera: shallow Brown soil, formed in gravelly colluvium
- Fortification: moderately deep equivalent of the Pukerau soil, with bedrock at 45–90cm depth

## 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 strong structure and well drained nature of the soil.
<b>Nutrient leaching</b>	severe	These soils have a severe vulnerability to leaching to groundwater. This rating reflects the good drainage and permeability. Those soils with high water holding capacity are likely to be moderately vulnerable.
<b>Topsoil erodibility by water</b>	slight	Due to the high organic matter and 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. The hilly and steep phases are likely to have nil vulnerability.

## 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.

### PuR3 (Pukerau rolling shallow)

Versatility evaluation for soil PuR3		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Limited	Restricted rooting depth.
Arable	Limited	Rolling slopes; restricted rooting depth.
Intensive pasture	Limited	Restricted rooting depth.
Forestry	Unsuitable	Shallow rock depth

### PuU3 (Pukerau undulating shallow)

Versatility evaluation for soil PuU3		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Limited	Restricted rooting depth.
Arable	Limited	Restricted rooting depth.
Intensive pasture	Limited	Restricted rooting depth.
Forestry	Unsuitable	Shallow rock depth

### PuH3 (Pukerau hilly shallow and PuS3 (Pukerau steep shallow)

Versatility evaluation for soil PuH3, PuS3		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Unsuitable	Hilly and steep slopes
Arable	Unsuitable	Hilly and steep slopes
Intensive pasture	Limited	Hilly and steep slopes; restricted rooting depth.
Forestry	Unsuitable	Shallow rock depth

### Management practices that may improve soil versatility

- Careful management of fertiliser nutrient applications to minimise leaching losses.