Soil name: Waiarikiki

Overview

Waiarikiki soils occur on rolling to steep slopes of the Hokonui Hills and the Kaiwera district, in upland areas above 300m altitude. These soils also occur on areas of south Otago outside the Topoclimate survey area. They are formed into mixed loess and weathered tuffaceous greywacke colluvium. Soils are well drained, moderately deep, with moderately high plant available water, and colluvial gravels occur throughout the soil, but are generally only moderately gravelly (<35%) above 45cm depth. Waiarikiki soils are strongly leached, with P-retention of >85% and pH of <5.5 typical in the subsoil. Present use is pastoral grazing with sheep and beef cattle. Climate is cool temperate with soils exposed to prevailing southerly winds. Regular rain occurs and soils rarely dry out.

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Physical properties

Waiarikiki soils have a moderately deep to deep (60–90cm) rooting depth, with moderately high plant available water, depending on the amount of gravels present. The soils are well drained, with moderate permeability, and aeration should be good. Textures are typically silt loams to clay loams, through some soils are more clayey with silty clay texture. Topsoil clay content is about 30–40%. Gravel occurs throughout the soil, but they are generally only moderately gravelly (<35%) above 45cm depth. Bedrock generally occurs below 90cm depth.

Fertility properties

Topsoil organic matter content is 9–12%; P-retention above 80% and pH moderate (low–mid 5s). Cation exchange values are high to moderate and base saturation levels very low. Available calcium, magnesium and potassium levels are low to very low. Reserve phosphorus levels are low. Micronutrient levels are generally adequate.

Associated and similar soils

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

- Otaraia: moderately leached Brown soil formed in deep loess
- Rosemarkie: strongly leached upland Brown soil formed in deep loess
- Pukerau: strongly leached shallow soil onto tuffaceous greywacke bedrock within 45cm depth

Some soils that have similar properties to Waiarikiki soils are:

- Fortification: moderately deep soil with tuffaceous greywacke bedrock between 45 and 90cm depth
- Kaiwera: strongly leached shallow Brown soil with >35% gravels within 45cm depth
- Venlaw: strongly leached Allophanic soil; upland equivalent of the Kaiwera soil

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 well drained nature of the soil and the moderate to high clay content, organic matter and high P-retention.
Nutrient leaching	severe	These soils have a severe vulnerability to leaching to groundwater. This rating reflects the well drained nature of the soil and moderate permeability.
Topsoil erodibility by water	minimal	Due to the moderate to high clay and organic matter content, topsoil erodibility in 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).
Waterlogging	slight	These soils have a slight vulnerability to waterlogging during wet periods. This rating reflects the well drained nature of the soil and moderate 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.

YrR2 (Waiarikiki rolling moderately deep)

Versatility evaluation for soil YrR2		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Moderate	Vulnerability to leaching to groundwater; restricted rooting depth.
Arable	Limited	Rolling slopes
Intensive pasture	Moderate	Vulnerability to leaching to groundwater; rolling slopes
Forestry	Moderate	Restricted rooting depth.

YrH2 (Waiarikiki hilly moderately deep)

Versatility evaluation for soil YrH2		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Unsuitable	Hilly slopes
Arable	Unsuitable	Hilly slopes
Intensive pasture	Limited	Hilly slopes
Forestry	Moderate	Hilly slopes; restricted rooting depth.

Management practices that may improve soil versatility

- Careful management after heavy rain and wet periods will reduce the impact of short-term waterlogging. Intensive stocking, cultivation and heavy vehicular traffic should be minimal during these periods.
- Carefully management of nutrient applications to minimise leaching