

This Technical Data 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. Advise 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: **Oreti Scarp**

Overview

Oreti Scarp soils occupy about 900 ha on the Waimea Plain in northern Southland and in the Garston district. They occur on the scarps of intermediate terraces in association with Oreti soils on the terrace flats. They are formed into colluvium of greywacke and schist gravels, with varying thickness of loess that has accumulated in more stable sites. Soils are a variable complex of soil profiles depending on the localised erosion patterns. Typically, though, they are well drained shallow soils with stony subsoils and have silty textures. Present use is pastoral farming with sheep and deer and farm forestry. Climate is temperate with warm summers. Regular rain occurs but soils are seasonally dry, particularly those facing north.

Soil classification

NZ Soil Classification (NZSC):

Acidic Orthic Brown; rounded-stony, hard sandstone; silty

Previous NZ Genetic Classification:

Strongly leached yellow-brown earth

Classification explanation

The NZSC of Oreti scarp soils is consistent with the previous classification. Typically, the soils are sufficiently stable to have subsoil B horizon development. They are moderately to strongly leached, with acidic subsoils (pH <5.5). The soils typically have silty topsoils and gravels occur with 45cm depth. Because of the variability of the terrace scarps they are also likely to have Recent soils on the more recently eroded sites.

Soil phases and variants

Identified units in the Oreti Scarp soils are:

- Oreti Scarp hilly (UOeH): has gravels within 45cm depth; occurs on slopes of 15–25°
- Oreti Scarp rolling (UOeR): has gravel within 45cm depth; occurs on slopes of 0–7°
- Oreti Scarp steep (UOeS): has gravel within 45cm depth; occurs on slopes of >25°

The soil properties described in this Technical Data Sheet are based on the most common phase, Oreti Scarp hilly (UOeH). Values for other phases and variants can be taken as being similar. Where they differ significantly they are recorded with a separate versatility rating, e.g., Oreti Scarp rolling (UOeR).

Associated soils

Some soils that commonly occur in association with Oreti Scarp soils are:

- Otama: low angle dunes with silty to loamy textures, and gravel below 45cm depth
- Crookston: formed in silty loess, with gravel below 45cm depth

Similar soils

Some soils that have similar properties to Oreti Scarp soils are:

- Kaweku Scarp: occurs on terrace scarps of high terraces; gravels are more weathered
- Oreti: occurs on the associated high terrace flats; more consistent soil profile

Typical profile features

The following is a 'generic' or composite profile description representing the most common combination of characteristics for this soil type. The actual profiles for which descriptions and data are available are listed at the end of this Technical Data Sheet.

Oreti Scarp profile	Horizon	Depth (cm)	Description
	Ap	0–32	Brownish black moderately gravelly loamy silt; weak soil strength; strongly developed very fine polyhedral structure; gravels slightly weathered and subrounded; abundant roots.
	Ap/Bw	32–52	Dull yellow-orange very gravelly loamy silt; many wormcasts; compact particle packing; moderately developed very fine polyhedral structure; gravels slightly weathered and subrounded; many roots.
	Bw	52–90+	Dull yellow-orange extremely gravelly loamy silt; compact particle packing; weakly developed extremely fine polyhedral structure; gravels slightly weathered and subrounded; few roots at top of horizon

Key profile features

Oreti Scarp topsoils are variable in depth but up to 30cm deep with moderate to strongly developed fine structure. Subsoils have a weakly developed structure.

Typical physical properties

Note: values in *Italics* are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Ap	0–32	—	<i>Rapid</i>	Silt loam	Moderately gravelly
Ap/Bw	32–52	—	<i>Rapid</i>	Loamy silt	Very gravelly
Bw	52–90+	—	<i>Rapid</i>	Loamy silt	Extremely gravelly

Profile drainage: Well
Plant readily available water: *Low*
Potential rooting depth: Shallow
Rooting restriction: Gravelly subsoil

Key physical properties

Oreti Scarp soils have a shallow to moderately deep rooting depth, with low plant available water, that varies depending on the abundance of gravels in the subsoil. The soils are typically well drained, with good aeration, and rapid permeability. Textures vary between silt loam to sands, with a topsoil clay content of about 10–20%. Soils are generally stony throughout.

Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Ap	0–32	Moderate	Low	Moderate	Low	Low	Moderate	Moderate	Low
Ap/Bw	32–52	Moderate	Moderate	Low	Low	Very low	Low	Low	Low
Bw	52–90+	Moderate	Moderate	Low	Very low	Very low	Very low	Very low	Very low

Key chemical properties

Topsoil organic matter levels are 3–6%; P-retention 20–30% and pH moderate (mid 5s). Topsoil cation exchange values are moderate and base saturation values low. Available calcium values are low, with magnesium and potassium values moderate. Available nutrients are low to very low in the subsoil. Soil reserve phosphorus and sulphur levels are low. Micronutrient levels are generally adequate.

Vulnerability to environmental degradation

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	moderate	These soils have a moderate 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, but moderate to low clay, organic matter and P-retention.
Nutrient leaching	very severe	These soils have a very severe vulnerability to leaching to groundwater. This rating reflects the low to moderate water holding capacity, with rapid permeability and well drained nature of the soil.
Topsoil erodibility by water	slight	Due to the moderate to low 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	nil	These soils have a nil vulnerability to waterlogging during wet periods. This rating reflects the well drained nature of the soil and rapid permeability.

General landuse versatility ratings for Oreti Scarp soils

Note: The versatility ratings in the table below are indicative of the major limitations for semi-intensive to intensive landuse. 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.

UOeH (Oreti Scarp hilly)

UOeS (Oreti Scarp steep)

Versatility evaluation for soil UOeH, UOeS		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Unsuitable	Hilly and steep slopes
Arable	Unsuitable	Hilly and steep slopes
Intensive pasture	Limited	Vulnerability to leaching to ground water; restricted rooting depth.
Forestry	Limited	Restricted rooting depth; steep slopes.

UOeR (Oreti Scarp rolling)

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

Management practices that may improve soil versatility

- Management of fertiliser nutrient applications that minimise leaching and runoff losses
- Careful management of topsoil organic matter levels

Soil profiles available for Oreti Scarp soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
UOeS	VT!!a	2	✓	✓	✓	✓
UOeS	GT5	4	✓	✓	✓	✓
UOeH	M246	26	✓	✓		
UOeS	VT!!b	2	✓	✓		

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