

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

Overview

Oreti soils occupy about 12,800ha on the intermediate terraces of the Waimea and Five Rivers plains, in the Matura and Oreti river catchments. They are formed in gravelly alluvium derived from greywacke and schist rock. Oreti soils are well drained, with silt loam topsoil texture. The soils are stony in both the topsoil and subsoil, which limits the rooting depth and water holding capacity. Oreti soils are used for sheep production, with some dairying and cropping. Rainfall is evenly spread but can be deficient in summer, when these soils may dry out.

Soil classification

NZ Soil Classification (NZSC):

Cemented Firm Brown; rounded-stony; hard sandstone; silty

Previous NZ Genetic Classification:

Intergrade between Yellow-grey and Yellow-brown earths

Classification explanation

The NZSC of Oreti soils is consistent with previous classifications. Oreti soils formed in alluvial deposits dominated by greywacke gravels, and have a cemented pan in the subsoil. The soils have silty textures in the topsoil. P-retention varies between 30 and 85%, depending on the degree of leaching.

Soil phases and variants

Identified units in the Oreti soils are:

- Oreti undulating shallow (OeU3): has gravel within 45cm depth and slopes of 0–7°

Associated soils

Some soils that commonly occur in association with Oreti 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

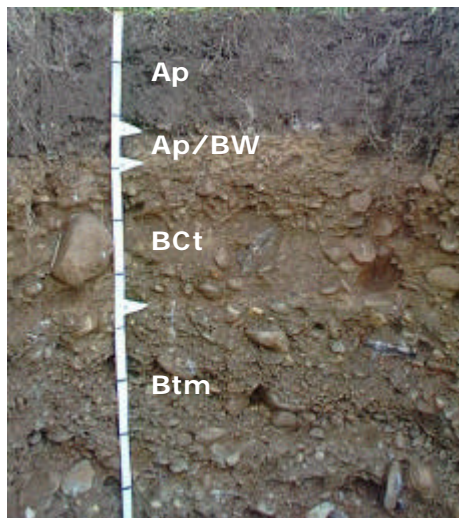
Similar soils

Some soils that have similar properties to Oreti soils are:

- Kaweku: on high terraces; gravels moderately weathered and not cemented
- Gore: on low terraces; gravels not cemented
- Glenelg: on intermediate terraces of the Aparima and Waiau rivers

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 profile	Horizon	Depth (cm)	Description
	Ap	0–22	Brownish black slightly gravelly silt loam; weak soil strength; moderately developed fine polyhedral structure; gravels rounded and slightly weathered; abundant roots
	Ap/Bw	22–30	Dull yellowish brown very gravelly silt loam; many wormcasts; compact particle packing; weakly developed fine polyhedral structure; gravels rounded and slightly weathered; abundant roots
	BCt	30–58	Dull yellowish brown extremely gravelly loamy sand; compact particle packing; single grain structure; gravels rounded and slightly weathered; common roots
	Btm	58–90	Dull yellowish brown extremely gravelly sand; dense particle packing; massive structure; gravels cemented by clay; no roots
	Btm	58–90	Dull yellowish brown extremely gravelly sand; dense particle packing; massive structure; gravels cemented by clay; no roots

Key profile features

Oreti soils have a topsoil 18–22cm deep, with moderately developed structure. Subsoil development is weak, with yellow brown colours and little structural development. Stones are slightly weathered throughout the profile. Pasture roots extend to 50–60 cm with few roots at lower depths, depending on gravel content and depth to the cemented pan.

Typical physical properties

Note: values in *Italics* are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Ap	0–22	Moderate – High	<i>Rapid</i>	Silt loam	Slightly gravelly
Ap/Bw	22–30	–	<i>Rapid</i>	Silt loam	Very gravelly
BCt	30–58	–	<i>Rapid</i>	Loamy sand	Very gravelly
Btm	58–90	–	<i>Rapid</i>	Sand	Extremely gravelly

Profile drainage: Well drained

Plant readily available water: *Low*

Potential rooting depth: Shallow-slightly deep

Rooting restriction: Extremely gravelly and cemented subsoil

Key physical properties

Oreti soils have a shallow to slightly deep rooting depth, depending on the gravel content and depth to the cemented pan in the subsoil. Plant available water varies from moderate to low depending on the quantity of gravel present. The soils are well drained (sometimes excessively) with good aeration. Topsoil textures are silt loams to sandy loams grading to sand in deeper horizons. Topsoil clay content is 15–25%. Gravel content is often above 70% in the subsoil.

Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Ap	0–22	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Low	Very low
Ap/Bw	22–30	Moderate	High	Moderate	Low	Very low	Very low	Very low	Very low
BCt	30–58	Moderate	High	Low	Very low	Very low	Very low	Very low	Very low
Btm	58–90	Moderate	Moderate	Low	Low	Low	Very low	Very low	Low

Additional chemical properties (as a profile average)

Reserve potassium (K) and sulphate sulphur values are low and phosphate values are moderate.

Key chemical properties

Topsoil organic matter levels range from 5 to 10%; P-retention values are variable ranging from 30 to 70%; pH is moderate (above 5.5) and changes little down the profile. Cation exchange values are moderate in topsoils but low in the subsoil. Available calcium, magnesium and potassium values are low. Phosphorus and sulphur reserves are low and good responses are likely. Micro-nutrient levels are generally adequate, although boron responses in brassicas and molybdenum responses in legumes can be expected.

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	Slight	These soils have a slight vulnerability to structural degradation by long-term cultivation, or compaction by heavy stocking and vehicles. This rating reflects the good drainage and moderate p-retention in the topsoil.
Nutrient leaching	Very severe	These soils have a very severe vulnerability to leaching to ground water. This rating reflects the good drainage, low total available water, and rapid permeability.
Topsoil erodibility by water	Slight	Due to the low-moderate clay and organic matter content, the topsoil erodibility of these soils is slight. Erodibility is highly dependent on management, especially 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 no vulnerability to waterlogging during wet periods. This rating reflects the good drainage and rapid permeability.

General landuse versatility ratings for Oreti 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.

OeU3 (Oreti undulating shallow)

Versatility evaluation for soil OeU3		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Limited	Shallow potential rooting depth and vulnerability to leaching to groundwater
Arable	Limited	Shallow potential rooting depth and vulnerability to leaching to groundwater
Intensive pasture	Limited	Shallow potential rooting depth and vulnerability to leaching to groundwater
Forestry	Limited	Shallow potential rooting depth

Management practices that may improve soil versatility

- Long-term cultivation should be carefully managed to minimise structural degradation
- Organic matter levels should be carefully maintained and enhanced
- Over cultivation of dry soils in summer may allow wind erosion
- Irrigation for intensive pasture and crop production to overcome summer moisture deficiencies.
- Management of nutrient applications that minimise leaching losses
- Ripping of subsoil pan may be possible for deep rooting plants

Soil profiles available for Oreti soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
OeU3	WT3	24	✓	✓	✓	✓
OeU3	G545	4	✓	✓	✓	
OeU3	SB7574	15	✓	✓		
OeU3	WT9	24	✓	✓	✓	✓
OeU3	FT7	15	✓	✓	✓	✓
OeU3	M1864	26	✓	✓	✓	
OeU3	GG/GW 95	26	✓	✓		
OeU3	150/75/29	43	✓	✓		

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