

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: **Orepuki**

Overview

Orepuki soils occupy about 2200 ha on low rocky peninsulas and isolated rocky outcrops on the south coast between Orepuki and Buff. They are formed into moderately deep to shallow loess overlying norite and tuffaceous greywacke bedrock. Orepuki soils are well drained, with a shallow rooting depth and moderate water-holding capacity that is limited by the gravelliness and bedrock that commonly occurs within 45cm depth. Present use is pastoral grazing with sheep, deer and beef cattle. Climate is cool temperate with prevailing southerly winds. Regular rain occurs throughout the year.

Soil classification

NZ Soil Classification (NZSC):

Acidic Orthic Brown; moderately deep on rock, gabbroic; silty.

Previous NZ Genetic Classification:

Moderately to strongly leached yellow-brown earth

Classification explanation

The NZSC of Orepuki soils is consistent with the previous classification. They are moderately leached soils with yellow-brown colours, and pH of <5.5 in the subsoil. Orepuki soils have silt loam textures, with norite and tuffaceous greywacke bedrock (classified as Gabbroic) typically occurring at less than 45cm depth.

Soil phases and variants

Identified units in the Orepuki soils are:

- Orepuki rolling moderately deep (OxR2): has gravel between 45 and 90cm depth; occurs on slope of 7–15°
- Orepuki hilly moderately deep (OxH2): has gravel between 45 and 90cm depth; occurs on slopes of 15–25°
- Orepuki steep moderately deep (OxS2): has gravel between 45 and 90cm depth; occurs on slopes of >25°
- Orepuki undulating shallow (OxU3): has gravel within 45cm depth; occurs on slopes of <7°
- Orepuki hilly shallow (OxH3): has gravel within 45cm depth; occurs on slopes of 15–25°
- Orepuki steep shallow (OxS3): 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, Orepuki rolling moderately deep (OxR2). 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., Orepuki hilly shallow (OxH3).

Associated soils

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

- Omaui: poorly drained, sandy textured soils forming into a complex of sand, loess, marine sediments, and bouldery colluvium
- Waihoaka: moderately well drained podzolised soil formed in deep loess
- Te Waewae: well to imperfectly drained soil formed in deep loess

Similar soils

Some soils that have similar properties to Orepuki soils are:

- Traill: strongly leached, podzolised soil with norite and tuffaceous greywacke bedrock between 45 and 90cm depth
- Craigdale: moderately leached Brown soil with tuffaceous greywacke bedrock between 45 and 90cm depth
- Taringatura: moderately leached Brown soil with greywacke and tuffaceous greywacke bedrock and colluvium within 45cm depth; occurs on the Taringatura Mountains

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.

Orepuki profile	Horizon	Depth (cm)	Description
	Ap	0–25	Brownish black silt loam; weak soil strength; moderately developed very fine polyhedral structure; abundant roots.
	Bw	25–62	Light brownish slightly gravelly clay loam; moderately developed polyhedral structure; common roots
	R	62+	On tuffaceous sandstone bedrock

Key profile features

Orepuki topsoils are 15–25cm deep with moderate structure. Subsoils also have moderate structure, but can be absent from soils in the shallow phase with bedrock near the surface. Some soils show signs of podzolisation, with iron/organic coatings in the subsoil.

Typical physical properties

Note: values in *Italics* are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Ap	0–25	Low – Moderate	<i>Moderate</i>	Silt loam	Gravel free
Bw	25–62	—	<i>Moderate</i>	Clay loam	Slightly gravelly
R	62+	—	—	—	Extremely gravelly

Profile drainage: Moderately well

Plant readily available water: *Moderate*

Potential rooting depth: Slightly deep

Rooting restriction: Bedrock

Key physical properties

Orepuki soils have moderate plant available water and shallow to slightly deep (25–60cm) rooting depth that is limited by the graveliness and bedrock in the subsoil. Soils are well aerated, with moderate permeability. Texture is variable, ranging from silt loam to sandy loam with occasional peaty loams. Topsoil clay content is about 20%.

Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Ap	0–25	Moderate	—	Very high	Low	High	High	Very high	—
Bw	25–45	Low	—	Very high	Low	Moderate	High	Moderate	—
R	45+	—	—	—	—	—	—	—	—

Key chemical properties

Topsoil organic matter content is about 16%, and topsoil pH moderate (mid 5s), becoming low in the subsoil. P-retention was not measured. Cation exchange is very high due to the high organic matter, but base saturation is low. Available calcium, magnesium and potassium levels are all high to moderate. Soil reserve phosphorus 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	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 high organic matter content and the well drained nature of the soil.
Nutrient leaching	severe	These soils have a severe vulnerability to leaching to groundwater. This rating reflects the good drainage and permeability, and moderate water holding capacity. The shallow phases are likely to have a very severe vulnerability.
Topsoil erodibility by water	minimal	Due to the high 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	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 well drained nature of the soil and moderate permeability.

General landuse versatility ratings for Orepuki 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.

OxR2 (Orepuki rolling moderately deep)

Versatility evaluation for soil OxR2		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Limited	Restricted rooting depth
Arable	Limited	Rolling slopes
Intensive pasture	Moderate	Vulnerability to leaching to groundwater; risk of short-term waterlogging after heavy rain.
Forestry	Limited	Restricted rooting depth.

OxH2 (Orepuki hilly moderately deep)

Versatility evaluation for soil OxH2		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Unsuitable	Hilly slopes
Arable	Unsuitable	Hilly slopes
Intensive pasture	Limited	Hilly slopes
Forestry	Limited	Restricted rooting depth

OxS2 (Orepuki steep moderately deep)

Versatility evaluation for soil OxS2		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Unsuitable	Steep slopes
Arable	Unsuitable	Steep slopes
Intensive pasture	Limited	Steep slopes
Forestry	Limited	Steep slopes; restricted rooting depth

OxU3 (Orepuki undulating shallow)

Versatility evaluation for soil OxU3		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Limited	Restricted rooting depth; shallow rock depth
Arable	Limited	Vulnerability to leaching to groundwater; restricted rooting depth.
Intensive pasture	Limited	Vulnerability to leaching to groundwater; restricted rooting depth.
Forestry	Unsuitable	Restricted rooting depth; shallow rock depth

OxH3 (Orepuki hilly shallow)**OxS3 (Orepuki steep shallow)**

Versatility evaluation for soil OxH3, OxS3		
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

- Management of nutrient applications so as to minimise leaching losses

Soil profiles available for Orepuki soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
OxU3	LT7	41	✓	✓	✓	✓
OxH3	SB2595	21	✓	✓	✓	
OxR2	176/71/16	40	✓			

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