

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: **Otatara**

Overview

Otatara soils occupy about 3,400 ha on coastal land between Orepuki and Waipapa Point. They are formed in deep wind blown sand, and are formed on older more stable dunes. These soils have a deep potential rooting depth, moderately high plant available water, with good drainage and have sandy textures throughout. They are presently used for pastoral farming with sheep, beef cattle and dairy production. Climate is cool temperate with regular rain and a prevailing south to westerly wind.

Soil classification

NZ Soil Classification (NZSC):

Typic Sandy Brown; stoneless; sandy

Previous NZ Genetic Classification:

Yellow-brown sand

Classification explanation

The NZSC of Otatara soils is consistent with the previous classification. The soils are formed in deep stone free sands, that are sufficiently old to have yellow-brown coloured B horizon development.

Soil phases and variants

Identified units in the Otatara soils are:

- Otatara undulating deep (ObU1): has no gravel within 90cm depth; occurs on slopes of 0–7°
- Otatara undulating deep imperfectly drained variant (ObU1vi): imperfectly drained; has no gravel within 90cm depth; occurs on slopes of 0–7°
- Otatara undulating moderately deep (ObU2): has gravel between 45 and 90cm depth; occurs on slopes of 0–7°
- Otatara rolling deep (ObR1): has no gravel within 90cm depth; occurs on slopes of 7–15°

The soil properties described in this Technical Data Sheet are based on the most common phase, Otatara undulating deep (ObU1). 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., Otatara rolling deep (ObR1).

Associated soils

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

- Fortrose: imperfectly drained soil formed in deep loess; has loamy silt textures
- Invercargill: very poorly drained soils, formed in deep peat

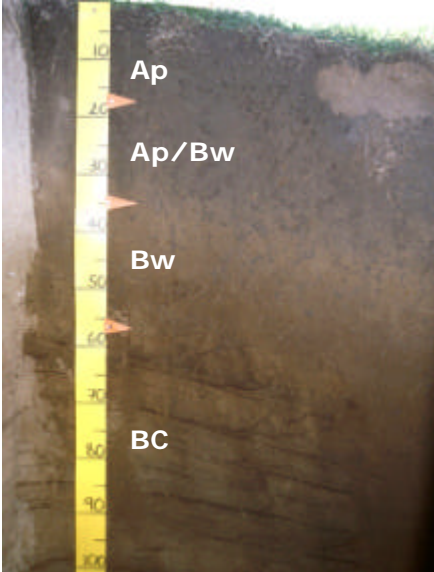
Similar soils

Some soils that have similar properties to Otatara soils are:

- Riverton: occur on actively accumulating sandy areas, soils show little subsoil development
- Otaitai: poorly drained sandy soil, formed in interdune hollows

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.

Otatara profile	Horizon	Depth (cm)	Description
	Ap	0–17	Brownish black sand; weak soil strength; weakly developed very fine and medium polyhedral structure; abundant roots
	Ap/Bw	17–35	Brown sand; abundant worm casts; few yellowish brown mottles; weak soil strength; weakly developed medium and coarse polyhedral structure; abundant roots
	Bw	35–57	Brown sand; few greyish yellow and yellowish brown mottles; weak soil strength; single grain structure; many roots
	BC	57–90+	Yellowish brown sand; slightly firm soil strength; single grain structure; few roots

Key profile features

Otatara soils have a dark coloured topsoil 17–25cm deep with a weakly developed structure. Subsoil development is also weakly developed. The brown colours of the subsoil reflect the subsoil weathering that is characteristic of these soils.

Typical physical properties

Note: values in *Italics* are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Ap	0–17	Moderate – High	<i>Rapid</i>	Loamy sand	Gravel free
Ap/Bw	17–35	Moderate – High	<i>Rapid</i>	Loamy sand	Gravel free
Bw	35–57	Moderate – High	<i>Rapid</i>	Sand	Gravel free
BC	57–90+	High	<i>Rapid</i>	Sand	Gravel free

Profile drainage:	Well
Plant readily available water:	<i>Moderately high</i>
Potential rooting depth:	Deep
Rooting restriction:	No major restriction

Key physical properties

Otatara soils have a deep rooting depth and moderately high plant available water capacity. Aeration and permeability are high throughout the profile. Textures are loamy sands in upper horizons grading to sand in the subsoil. Topsoil clay content is about 10–20%. Soils contain no stones.

Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Ap	0–17	Moderate	Very low	Low	High	Low	Moderate	Low	Moderate
Ap/Bw	17–35	Moderate	Low	Very low	Moderate	Very low	Low	Low	Low
Bw	35–57	Moderate	Low	Very low	Low	Very low	Very low	Very low	Low
BC	57–90+	Moderate	Low	Very low	Low	Very low	Very low	Very low	Low

Key chemical properties

Topsoil organic matter levels are 4–6%; P-retention less than 10–40% and pH moderate (high 5s). Cation exchange is low with base saturation high. Available calcium and potassium levels are low with magnesium and sodium levels moderate. Reserve phosphorus levels are low with sulphur levels high. 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	very severe	These soils have a very severe vulnerability to structural degradation by long-term cultivation, or compaction by heavy stocking and vehicles. This rating reflects the low organic matter, clay content, and P-retention.
Nutrient leaching	very severe	These soils have a very severe vulnerability to leaching to groundwater. This rating reflects the good drainage and rapid permeability of the subsoil.
Topsoil erodibility by water	severe	Due to the low organic matter and clay content, topsoil erodibility in these soils is severe. 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 good drainage and permeability.

General landuse versatility ratings for Otatara 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.

ObU1 (Otatara undulating deep)

ObU1vi (Otatara undulating deep imperfectly drained variant)

ObU2 (Otatara undulating moderately deep)

Versatility evaluation for soil ObU1, ObU1vi, ObU2		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Limited	Vulnerability to topsoil structural degradation and compaction; vulnerability to leaching to groundwater
Arable	Limited	Vulnerability to topsoil structural degradation and compaction; vulnerability to topsoil erosion by water and wind.
Intensive pasture	Limited	Vulnerability to topsoil structural degradation and compaction; vulnerability to leaching to groundwater
Forestry	Limited	Vulnerability to topsoil structural degradation and compaction; vulnerability to topsoil erosion by water and wind.

ObR1 (Otatara rolling deep)

Versatility evaluation for soil ObR1		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Limited	Vulnerability to topsoil structural degradation and compaction; vulnerability to leaching to groundwater
Arable	Limited	Vulnerability to topsoil structural degradation and compaction; rolling slopes
Intensive pasture	Limited	Vulnerability to topsoil structural degradation and compaction; vulnerability to leaching to groundwater
Forestry	Limited	Vulnerability to topsoil structural degradation and compaction; vulnerability to topsoil erosion by water and wind.

Management practices that may improve soil versatility

- Organic matter levels should be carefully maintained and enhanced
- Long-term intensive cultivation should be carefully managed to minimise structural degradation
- Management of nutrient applications that minimise leaching losses
- Careful management when paddocks are cultivated to minimise water and wind erosion. If a fine tilth is created these situations are aggravated

Soil profiles available for Otatara soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
ObR1	ST12	29	✓	✓	✓	✓
ObU1vi	ST15	29	✓	✓	✓	✓
ObU1	SB7435	21	✓	✓	✓	
ObR1	SB7436	21	✓	✓	✓	

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