

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: Wyndham

Overview

Wyndham soils occupy about 4,000 ha on terraces and downs on the east side of the Mataura River between Gore and Waimahaka. They are formed into near-source loess from the Mataura River that is derived from schist and greywacke rock. Wyndham soils are imperfectly drained, have a deep rooting depth, high water-holding capacity, and loamy silt textures with P-retention between 25 and 50%. Present use is pastoral farming with sheep beef and dairy cattle and some deer. Climate is cool temperate with regular rainfall. Soils rarely dry out.

Soil classification

NZ Soil Classification (NZSC):

Mottled-pallic Firm Brown; stoneless; silty.

Previous NZ Genetic Classification:

Moderately to strongly leached yellow-brown earth.

Classification explanation

The NZSC of the Wyndham soil differs from the previous classification. The soils are now recognised as having properties intergrading with Pallic soils, reflected in the lower subsoil having pale yellow-brown colours (hue 2.5Y) and P-retention values of 20–40%. There is a subsoil horizon that is structureless, with slightly firm or greater soil strength that may cause short-term waterlogging after heavy rainfall. This is reflected in the imperfect drainage of these soils. The soils are typically stone free and have loamy silt textures to 90cm depth.

Soil phases and variants

Identified units in the Wyndham soils are:

- Wyndham undulating deep (WmU1): has no gravel within 90cm depth; occurs on slopes of 0–7°
- Wyndham rolling deep (WmR1): has no gravel within 90cm depth; occurs on slopes of 7–15°
- Wyndham hilly deep (WmH1): has no gravel within 90cm depth; occurs on slopes of 15–25°

The soil properties described in this Technical Data Sheet are based on the most common phase, Wyndham undulating deep (WmU1). 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., Wyndham hilly deep (WmH1).

Associated soils

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

- Tuturau: well drained equivalent of the Wyndham soil
- Tokanui: well drained soil that occurs on rolling to hilly land in more distal source loess; has heavy silt loam texture and is more weathered, with yellow-brown colours and P-retention of 60–80% throughout the profile.
- Jacobstown: poorly drained floodplain soil, due to a high groundwater table

Similar soils

Some soils that have similar properties to Wyndham soils are:

- Fortrose: similar soil south of Waimahaka; shows greater weathering, with higher P-retention, and found in complexes with soils that show podzolised properties.
- Chaslans: imperfectly drained soil that occurs on rolling to hilly land in more distal source loess; has heavy silt loam texture and is more weathered, with yellow-brown colours and P-retention of 60–80% throughout the profile.
- Arthurton: also has Brown to Pallic intergrade properties, but has silt loam textures throughout

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.

Wyndham profile	Horizon	Depth (cm)	Description
	Ap	0–20	Greyish yellow-brown silt loam; weak soil strength; moderately developed medium to coarse prismatic and very fine to medium polyhedral structure; abundant roots
	Ap/Bw(g)	20–41	Bright yellowish brown silt loam; few bright brown and common greyish yellow mottles; many worm casts; weak soil strength; strongly developed very fine to fine polyhedral and medium to coarse prismatic structure; abundant roots
	Bw(g)	41–60	Dull yellow silt loam; many dull yellow orange mottles ; few orange sesquioxide coats; slightly firm soil strength; moderately developed medium to coarse prismatic and fine to medium polyhedral structure; common roots
	BC	60–90+	Dull yellow loamy silt; slightly firm soil strength; massive structure; few roots
	BC	60–90+	Dull yellow loamy silt; slightly firm soil strength; massive structure; few roots

Key profile features

Wyndham soils have a topsoil that is about 20–30cm deep and is moderately to strongly structured. Subsoils have moderate structure which grades to structureless below about 50cm. The upper subsoil is moderately weathered, with yellowish brown colour, and the lower subsoil is less weathered with dull yellow colours. The subsoil mottling reflects the imperfect drainage.

Typical physical properties

Note: values in *Italics* are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Ap	0–20	Moderate	<i>Moderate</i>	Silt loam	Gravel free
Ap/Bw(g)	20–41	Moderate – High	<i>Moderate</i>	Silt loam	Gravel free
Bw(g)	41–60	Moderate – High	<i>Moderate</i>	Silt loam	Gravel free
BC	60–90+	Moderate – High	<i>Slow</i>	Silt loam	Gravel free

Profile drainage: Imperfect
Plant readily available water: *High*
Potential rooting depth: Deep
Rooting restriction: No major restriction

Key physical properties

Wyndham soils have a deep rooting depth with high plant available water. the soils are imperfectly drained due to the slow permeability of the lower subsoil This may limit aeration during wet periods. Texture is light silt loam in the topsoil and loamy silt in the subsoil, with topsoil clay content of 15–25%. Soils contain no gravel.

Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Ap	0–20	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Moderate	Low
Ap/Bw(g)	20–41	Moderate	Moderate	Low	Low	Low	Very low	Very low	Low
Bw(g)	41–60	High	Moderate	Low	Low	Very low	Very low	Very low	Low
BC	60–90	High	Moderate	Low	Low	Very low	Very low	Very low	Low

Key chemical properties

Topsoil organic matter levels are 5–8%; P-retention 25–50% and pH moderate (low 6s). Topsoil cation exchange and base saturation values are both moderate. Available calcium and potassium values are moderate and magnesium values low. 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	severe	These soils have a severe vulnerability to structural degradation by long-term cultivation, or compaction by heavy stocking and vehicles. This rating reflects the imperfect drainage, low topsoil clay, organic matter and P-retention.
Nutrient leaching	slight	These soils have a slight vulnerability to leaching to groundwater. This rating reflects the imperfect drainage and high water-holding capacity.
Topsoil erodibility by water	moderate	Due to the low clay and organic matter content, topsoil erodibility in these soils is moderate. Erodibility is highly dependent on management, particularly when there is no vegetation cover.
Organic matter loss	slight	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	moderate	These soils have a moderate vulnerability to waterlogging during wet periods. This rating reflects the imperfect drainage and slowly permeable subsoil.

General landuse versatility ratings for Wyndham 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.

WmU1 (Wyndham undulating deep)

Versatility evaluation for soil WmU1		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Moderate	Inadequate aeration during wet periods; vulnerability to topsoil structural degradation by cultivation and compaction
Arable	Moderate	Inadequate aeration during wet periods; vulnerability to topsoil structural degradation by cultivation and compaction
Intensive pasture	Moderate	Inadequate aeration during wet periods; vulnerability to topsoil structural degradation by cultivation and compaction
Forestry	Moderate	Vulnerability to topsoil structural degradation by cultivation and compaction; vulnerability to sustained waterlogging.

WmR1 (Wyndham rolling deep)

Versatility evaluation for soil WmR1		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Moderate	Inadequate aeration during wet periods; vulnerability to topsoil structural degradation by cultivation and compaction
Arable	Limited	Rolling slopes
Intensive pasture	Moderate	Inadequate aeration during wet periods; vulnerability to topsoil structural degradation by cultivation and compaction
Forestry	Moderate	Vulnerability to topsoil structural degradation by cultivation and compaction; vulnerability to sustained waterlogging.

WmH1 (Wyndham hilly deep)

Versatility evaluation for soil WmH1		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Unsuitable	Hilly slopes
Arable	Unsuitable	Hilly slopes
Intensive pasture	Limited	Hilly slopes
Forestry	Moderate	Vulnerability to topsoil structural degradation by cultivation and compaction; vulnerability to sustained waterlogging.

Management practices that may improve soil versatility

- Careful management after heavy rain and wet periods will reduce the impact of short-term water logging. Intensive stocking, cultivation and heavy vehicular traffic should be minimal during these periods.
- Installation and maintenance of subsurface mole and tile drains will reduce the risk of short-term waterlogging.
- Organic matter levels should be carefully maintained and enhanced

Soil profiles available for Wyndham soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
WmU1	MWT19	28b	✓	✓	✓	✓
WmU1	QT5	42	✓	✓	✓	✓

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