

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: **Wendon**

Overview

Wendon soils occupy about 6,400 ha on undulating to steep slopes of hilly land in northern and eastern Southland. They are formed into thin loess overlying bedrock or stony colluvium from greywacke. Wendon soils are well drained, with a shallow rooting depth and moderate water holding capacity that is limited by the graveliness and bedrock that commonly occurs within 45cm depth. They are used for extensive pastoral grazing with sheep and beef cattle. Climate is cool temperate with regular rain, though these soils can dry out in summer because of their shallow depth and good drainage.

Soil classification

NZ Soil Classification (NZSC): Acidic Orthic Brown; lithic, hard sandstone; silty
Previous NZ Genetic Classification: Strongly leached lowland yellow-brown earth

Classification explanation

The NZSC of Wendon soils is consistent with the previous classification. They are moderately leached soils with yellow-brown colours, P-retention of 25–50% and subsoil pH of less than 5.5. Wendon soils have silt loam textures, and greywacke bedrock typically occurs at less than 45cm depth.

Soil phases and variants

Identified units in the Wendon soils are:

- Wendon rolling shallow (WeR3): has gravel and/or rock within 45cm; occurs on slopes of 7–15°
- Wendon undulating shallow (WeU3): has gravel and/or rock within 45cm; occurs on slopes of 0–7°
- Wendon hilly shallow (WeH3): has gravel and/or rock within 45cm; occurs on slopes of 15–25°
- Wendon steep shallow (WeS3): has gravel and/or rock within 45cm; occurs on slopes of >25°

The soil properties described in this Technical Data Sheet are based on the most common phase, Wendon rolling shallow (WeR3). 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., Wendon hilly shallow (WeH3).

Associated soils

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

- Waikoikoi: poorly drained, deep soil with a fragipan; formed in deep loess
- Glenure: poorly drained deep soil without a fragipan; formed in deep loess
- Josephville: well drained soil formed in a mix of stony colluvium and a significant proportion of loess; is gravelly but has <35% gravel within 45cm depth
- Waikaka: well drained Brown soil formed into deep loess

Similar soils

Some soils that have similar properties to Wendon soils are:

- Taringatura: moderately leached Brown soil; formed on tuffaceous greywacke and greywacke bedrock and stony colluvium of the Taringatura Hills
- Tyneholm: moderately leached Brown soil with tuffaceous greywacke bedrock within 45cm depth
- Mandeville: Melanic soil with tuffaceous greywacke bedrock within 45cm depth
- Pukekoma: strongly leached Brown soil with pH <4.8 formed on greywacke and subschist bedrock within 45cm depth.

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.

Wendon profile	Horizon	Depth (cm)	Description
	Ah	0–25	Brownish black moderately gravelly silt loam; weak soil strength; moderately developed fine polyhedral structure; gravels are angular and slightly weathered; abundant roots.
	Ah/Bw	25–42	Bright yellowish brown very gravelly silt loam; common worm casts; compact particle packing; moderately developed fine polyhedral structure; gravels are angular and slightly weathered; many roots.
	Bw/R	42–75	Bright yellowish brown extremely gravelly silt loam; weakly developed fine polyhedral structure; gravels are shattered bedrock; many roots
	R	75+	Greywacke bedrock

Key profile features

Wendon soils have a topsoil 20–25cm deep with a strong structure. Subsoils have a moderate structure with bright yellowish brown colours. These colours reflect strong weathering in these soils. Soils are very gravelly throughout.

Typical physical properties

Note: values in *Italics* are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Ah	0–25	Moderate	<i>Rapid</i>	Silt loam	Moderately gravelly
Ah/Bw	25–42	—	<i>Rapid</i>	Silt loam	Very gravelly
Bw/R	42–75	—	—	Silt loam	Extremely gravelly
R	75–90	—	—	—	Extremely gravelly

Profile drainage:	Well
Plant readily available water:	<i>Moderate</i>
Potential rooting depth:	Shallow
Rooting restriction:	Subsoil graveliness and/or presence of bedrock

Key physical properties

Wendon soils have a shallow rooting depth, restricted by the graveliness and bedrock in the subsoil, and moderate available water. These soils are well drained, with good aeration and permeability throughout the soil. Textures are typically silt loam, with topsoil clay content of 15–30%. The soils are gravelly throughout, and typically have at least 35% gravel within 45cm depth. Bedrock also typically occurs within 45cm depth.

Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Ah	0–25	Moderate	Low	Moderate	High	High	Moderate	Moderate	Low
Ah/Bw	25–42	Moderate	Moderate	Moderate	Low	Low	Moderate	Very low	Low
Bw/R	42–75	Moderate	Moderate	Moderate	Very low	Very low	Low	Very low	Low
R	75–90	—	—	—	—	—	—	—	—

Key chemical properties

Topsoil organic matter levels are 6–9%; P-retention values <25% and pH values moderate (typically below 5.5 in the subsoil). Cation exchange is moderate throughout the profile. Base saturation is high in the topsoil but low in the subsoil. Availability of calcium, magnesium and potassium is moderate to low. Natural reserves of phosphorus and sulphur are low. Micro-nutrient levels are generally adequate but molybdenum may be required for legumes.

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 low P-retention and moderate to low clay percentage.
Nutrient leaching	very severe	These soils have a very severe vulnerability to leaching to groundwater. This rating reflects the good drainage, rapid permeability, and moderate water-holding capacity.
Topsoil erodibility by water	slight	Due to the silt loam texture, the topsoil erodibility of 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 good drainage, permeability, and the rolling to steep slopes.

General landuse versatility ratings for Wendon soils

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

WeR3 (Wendon rolling shallow)

Versatility evaluation for soil WeR3		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Limited	Restricted rooting depth
Arable	Limited	Rolling slopes; restricted rooting depth
Intensive pasture	Limited	Vulnerability to leaching to groundwater; restricted rooting depth
Forestry	Unsuitable	Shallow rock depth

WeU3 (Wendon undulating shallow)

Versatility evaluation for soil WeU3		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Limited	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	Shallow rock depth

WeH3 (Wendon hilly shallow)
WeS3 (Wendon steep shallow)

Versatility evaluation for soil WeH3, WeS3		
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 that minimise leaching losses

Soil profiles available for Wendon soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
WeR3	BT19	12	✓	✓	✓	✓
WeR3	PCT03	33	✓	✓	✓	✓
WeH3	BL132	12	✓	✓	✓	✓
WeH3	BL133	12	✓	✓	✓	✓
WeH3	GG/GW127	35	✓	✓		
WeS3	GG/GW136	35	✓	✓		

Published by Crops for Southland with financial support from Environment Southland.

Copyright © 2002, Crops for Southland

This Technical Data Sheet may be reproduced in whole or in part and in any form for educational or non-profit purposes without special permission from the copyright holder, provided acknowledgement of the source is made. Crops for Southland and Environment Southland would appreciate receiving a copy of any publication that uses this Technical Data Sheet as a source.

No use of this Technical Data Sheet may be made for resale or for any other commercial purpose whatsoever without prior permission in writing from Crops for Southland.

Crops for Southland
 PO Box 1306, Invercargill. New Zealand



www.cropssouthland.co.nz