

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: **Tisbury**

Overview

Tisbury soils occupy about 4,000 ha on marine and alluvial terraces in the coastal area of the Southland plain between Riverton and Gorge Road. They are formed into deep loess derived from greywacke and schist rocks. Soils are poorly drained, have a deep rooting depth, high water holding capacity and silty textures, with some topsoils slightly peaty. Present use is pastoral farming with sheep, beef cattle and dairy production. Climate is cool temperate with regular rain. Soils rarely dry out.

Soil classification

NZ Soil Classification (NZSC): Acidic Orthic Gley; stoneless; silty

Previous NZ Genetic Classification: Podzolised yellow-brown earth

Classification explanation

Tisbury soils have been reclassified in this survey as the soil properties are consistent with Gley soils. The Gley soils were the dominant soil previously mapped in the Tisbury set, and the Tisbury name has been maintained for these soils, with podzolised soils separated into the Kapuka, Tiwai, and Ashers soils. Tisbury soils are classified as Gley soils in the NZSC because the poor drainage of Tisbury soils is due to a high groundwater table, or water perching on a dense subsoil layer that occurs at greater than 100cm depth. Tisbury soils have subsoils that show structural development, are acidic (pH <5.5), and typically have gravel at greater than 90cm depth, with silt loam textures.

Soil phases and variants

Identified units in the Tisbury soils are:

- Tisbury undulating deep (TsU1): has no gravel within 90cm depth; occurs on slopes of 0–7°
- Tisbury rolling deep (TsR1): has no gravel within 90cm depth; occurs on slopes of 7–15°
- Tisbury undulating moderately deep (TsU2): has gravel between 45 and 90cm depth; occurs on slopes of 0–7°

The soil properties described in this Technical Data Sheet are based on the most common phase, Tisbury undulating deep (TsU1). Values for other phases and variants can be taken as being similar. Where they differ significantly they are recorded with a separate versatility rating.

Associated soils

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

- Mokotua: deep Brown soil, with imperfect drainage tending towards poorly drained
- Woodlands: deep Brown soil, with imperfect drainage tending towards moderately well drained
- Ashers: podzolised soil formed into deep loess
- Kapuka: podzolised, imperfectly drained, shallow to moderately deep soil on marine terraces
- Tiwai: podzolised shallow to moderately deep soil on marine terraces with thin iron pans and cemented underlying gravels; tend to have dominantly organic -enriched Bh horizons, whereas Kapuka tends to have dominantly iron-enriched Bs horizons

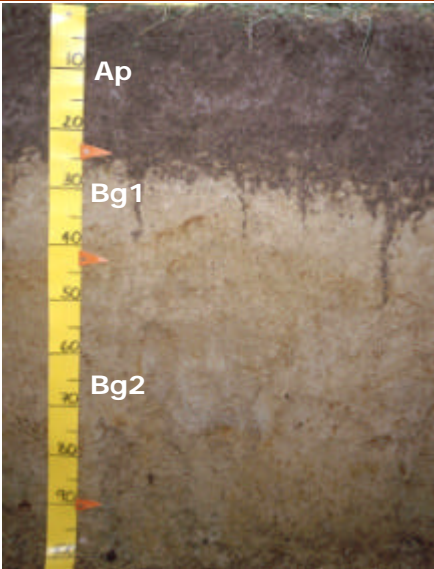
Similar soils

Some soils that have similar properties to Tisbury soils are:

- Braxton: poorly drained moderately deep to deep soil on intermediate terraces adjacent to the Aparima River and Waiiau Valley; has heavy silt loam to silty clay textures
- Titipua: young poorly drained soil with peaty topsoils
- Dacre: young poorly drained soil on floodplains

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.

Tisbury profile	Horizon	Depth (cm)	Description
	Ap	0–24	Greyish yellow-brown silt loam; few dark reddish brown mottles; weak soil strength; moderately developed fine to medium polyhedral structure; many roots
	Bg1	24–42	Dull yellow silt loam; many dull yellow and few dark reddish brown mottles; very few black segregations; few dark reddish brown sesquioxide coats on ped faces; few worm casts; slightly firm soil strength; moderately developed fine to medium polyhedral structure; common roots
	Bg2	42–90	Dull yellow silt loam; few dark reddish brown and few yellowish brown mottles; few reddish brown segregations; few dark reddish brown sesquioxide coats on ped faces; few worm casts; weak soil strength; moderately developed medium to coarse prismatic structure; few roots

Key profile features

Tisbury topsoils are 24–32cm deep with a moderately developed structure. Subsoil structural development is also moderate. The dominance of grey colours throughout the subsoil reflects the poor drainage of the soils.

Typical physical properties

Note: values in *Italics* are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Ap	0–24	Moderate	<i>Moderate</i>	Silt loam	Gravel free
Bg1	24–42	Moderate – High	<i>Slow</i>	Silt loam	Gravel free
Bg2	42–90	Moderate – High	<i>Slow</i>	Silt loam	Gravel free

Profile drainage: Poor
Plant readily available water: *High*
Potential rooting depth: Deep
Rooting restriction: Limited subsoil aeration during sustained wet periods.

Key physical properties

Tisbury soils have a deep rooting depth and high plant available soil water, although the rooting depth may be limited by poor aeration during wet periods due to the poor drainage and slow subsoil permeability. Mottles occur in all horizons – another indication of poor drainage. Texture is silt loam in all horizons, with a topsoil clay content of 20–25%. The soils are typically stone-free, although the moderately deep phase will have gravel between 45 and 90cm depth.

Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Ap	0–24	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Very low	Moderate
Bg1	24–42	Moderate	High	Low	Low	Low	Very low	Very low	Low
Bg2	42–90	Moderate	Moderate	Low	Low	Low	Very low	Very low	Low

Key chemical properties

Topsoil organic matter levels are 8–17%; P-retention 49–64% and pH moderate (high 5s) in the topsoil, with typically low subsoil pH (low 5s). Cation exchange and base saturation values are moderate. Available calcium levels are moderate and magnesium and potassium levels low. Soil reserve phosphorus levels are low. Miconutrient 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, with moderate to high P-retention and clay content, offset by the poor drainage.
Nutrient leaching	slight	These soils have a slight vulnerability to leaching to groundwater. This rating reflects the poor drainage, slow permeability and high water-holding capacity.
Topsoil erodibility by water	slight	Due to the high organic matter content and moderate clay content, topsoil erodibility in these soils is slight. Erodibility is highly dependent on management, particularly when there is no vegetation cover.
Organic matter loss	minimal	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	severe	These soils have a severe vulnerability to waterlogging during wet periods. This rating reflects the poor drainage and slow permeability.

General landuse versatility ratings for Tisbury 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.

TsU1 (Tisbury undulating deep)

TsU2 (Tisbury undulating moderately deep)

TsR1 (Tisbury rolling deep)

Versatility evaluation for soil TsU1, TsU2, TsR1		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Limited	Inadequate aeration during wet periods; risk of short-term waterlogging during wet periods
Arable	Limited	Inadequate aeration during wet periods; vulnerability to sustained waterlogging
Intensive pasture	Limited	Risk of short-term waterlogging
Forestry	Limited	Inadequate aeration during wet periods; vulnerability to sustained waterlogging during wet periods

Management practices that may improve soil versatility

- Careful management after heavy rain and wet periods will reduce the risk of short-term waterlogging. Intensive stocking, cultivation and heavy vehicular traffic use should be minimised during these periods.
- Installation and maintenance of subsurface mole and tile drains will reduce the risk of short-term waterlogging.
- If compaction occurs, aeration at the correct moisture condition and depth can be of benefit.

Soil profiles available for Tisbury soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
TsU1	ET7	28A	✓	✓	✓	✓
TsU1	CT9	6	✓	✓	✓	✓
TsU1	ET4	28A	✓	✓	✓	✓
TsU2	LT24	41	✓	✓	✓	✓
TsU1	UT16	14	✓	✓	✓	✓

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Crops for Southland
PO Box 1306, Invercargill. New Zealand



www.cropssouthland.co.nz