

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: **Jacobstown**

### Overview

Jacobstown soils occupy about 26,600 ha on the floodplains of rivers and streams in eastern, northern and southern Southland and south Otago. They are formed in fine alluvium derived from greywacke and schist. These soils are moderately deep to deep, poorly drained, and have silty textures. They are used for intensive pastoral farming with sheep, dairy and deer and some cropping. Climate is cool temperate with regular rain, so soils rarely dry out.

### Soil classification

**NZ Soil Classification (NZSC):** Acidic Orthic Gley; stoneless; silty  
**Previous NZ Genetic Classification:** Moderately to strongly gleyed recent soil.

#### Classification explanation

The NZSC for Jacobstown soils is consistent with the previous classification. The soils are poorly drained due to a high groundwater table, and accumulation of sediment is sufficiently slow that subsoils show structural development. The soils are typically stone free, have silty textures, and acidic subsoils with pH of less than 5.5.

### Soil phases and variants

Identified units in the Jacobstown soils are:

- Jacobstown undulating deep (JnU1): has no gravels within 90cm; occurs on slopes of 0–7°
- Jaconstown undulating moderately deep (JnU2): has gravels between 45 and 90 cm; occurs on slopes of 0–7°

The soil properties described in this Technical Data Sheet are based on the most common phase, Jacobstown undulating deep (JnU1). Values for other phases and variants can be taken as being similar.

### Associated soils

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

- Fleming: poorly to imperfectly drained soil with a subsoil fragipan; formed in alluvium
- Makarewa: similar profile but has silty clay textures
- Waikoikoi: poorly drained soil due to subsoil fragipan; occurs on terraces and downlands.

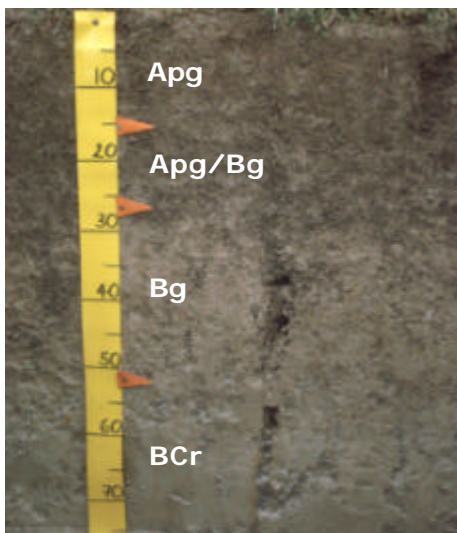
## Similar soils

Some soils that have similar properties to Jacobstown soils are:

- Lumsden: shallow, poorly drained soil with silty textures
- Dacre: associated with Brown soils of the Southland plain; typically shows less profile development.
- Caroline: has a cemented ironpan in the subsoil
- Glenure: silty textured gley soil formed in loess; occurs on terraces and downlands.

## 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.

Jacobstown profile	Horizon	Depth (cm)	Description
	Apg	0–19	Greyish yellow-brown silt loam; few bright brown mottles; weak soil strength; strongly developed moderately fine polyhedral structure; abundant roots
	Apg/Bg	19–34	Greyish yellow silt loam; few dull yellow-orange mottles; abundant worm casts; weak soil strength; moderately developed medium polyhedral structure; abundant roots
	Bg	34–60	Greyish yellow silt loam; very few dull yellow orange mottles; few worm casts; weak soil strength; moderately developed medium to coarse prismatic structure; abundant roots
	Bg	34–60	Greyish yellow silt loam; very few dull yellow orange mottles; few worm casts; weak soil strength; moderately developed medium to coarse prismatic structure; abundant roots
	BCr	60–90	Light grey silt loam; few yellowish brown selvedge mottles; slightly firm soil strength; massive structure; common roots.

## Key profile features

Jacobstown soils have a topsoil 20–30cm deep which has a moderately developed structure. Subsoil structural development is also moderate, but grades to a massive structure at depth. 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
Apg	0–19	Moderate	<i>Moderate</i>	Silt loam	Gravel free
Apg/Bg	19–34	Moderate	<i>Moderate</i>	Silt loam	Gravel free
Bg	34–60	Moderate – High	<i>Slow</i>	Silt loam	Gravel free
BCr	60–90	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

Jacobstown soils have a deep rooting depth and high 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. Texture is typically silt loam and topsoil clay content is 15–30%. 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
Apg	0–19	Moderate	Moderate	Moderate	Low	Moderate	Moderate	Moderate	Low
Apg/Bg	19–34	Moderate	Moderate	Moderate	Low	Low	Low	Moderate	Low
Bg	34–60	Low	Moderate	Moderate	Low	Low	Low	Moderate	Low
BCr	60–90	Low	Moderate	Moderate	Moderate	Moderate	—	Low	Low

## Key chemical properties

Topsoil organic matter values range from 4 to 10%; P-retention values 25–45%; pH values are moderate, and moderate to low in the subsoil. Cation exchange values are moderate throughout the profile but base saturation is low. There are moderate levels of calcium, magnesium and potassium in the topsoil, but lower levels in the subsoil. Natural reserves of phosphorus are low. Micro-nutrient 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
<b>Structural compaction</b>	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 poor drainage.
<b>Nutrient leaching</b>	slight	These soils have a slight vulnerability to leaching to groundwater. This rating reflects the high water-holding capacity and slow subsoil permeability.
<b>Topsoil erodibility by water</b>	slight	Due to the light silt loam texture, the topsoil erodibility of these soils is slight. Erodibility is highly dependent on management, particularly when there is no vegetation cover.
<b>Organic matter loss</b>	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).
<b>Waterlogging</b>	severe	These soils have a severe vulnerability to waterlogging during wet periods. This rating reflects the poor drainage and slow subsoil permeability.

## General landuse versatility ratings for Jacobstown 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.

### JuU1: (Jacobstown undulating deep)

### JnU2: Jacobstown undulating moderately deep)

Versatility evaluation for soil JnU1, JnU2		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Limited	Inadequate drainage during wet periods; risk of short-term waterlogging after heavy rain.
Arable	Limited	Inadequate drainage during wet periods; risk of short-term waterlogging after heavy rain.
Intensive pasture	Moderate	Inadequate drainage during wet periods; vulnerability of topsoil to structural degradation by cultivation and compaction.
Forestry	Limited	Inadequate aeration during wet periods; potential flood risk

### Management practices that may improve soil versatility

- Careful management after heavy rain and wet periods will reduce the impact of short-term waterlogging. Intensive stocking, cultivation and heavy vehicular traffic should be minimised during these periods.
- Installation and maintenance of sub-surface 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 Jacobstown soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
JnU1	MWT9	28B	✓	✓	✓	✓
JnU1	MWT8	28B	✓	✓	✓	✓
JnU1	MWT23	28B	✓	✓	✓	✓
Jnu1	MWT7	28B	✓	✓	✓	✓
JnU1	VT6	2	✓	✓	✓	✓
JnU1	PCT5	33	✓	✓	✓	✓
JnU1	QT9	42	✓	✓	✓	✓
JnU1	B12	12	✓	✓	✓	✓
JnU1	GMT9	27	✓	✓	✓	✓
JnU1	DT5	37	✓	✓	✓	✓
JnU1	ET16	28A	✓	✓	✓	✓
JnU1	MWT5	28B	✓	✓	✓	✓
JnU1	G504	4	✓	✓	✓	✓
JnU1	FT19	15	✓	✓	✓	✓
Jnu1	ET1	28A	✓	✓	✓	✓
JnU1	EMT1	18	✓	✓	✓	✓
JnU1	ET9	28A	✓	✓	✓	✓
JnU1	NT7	30	✓	✓	✓	✓
JnU1	QT7	42	✓	✓	✓	✓
JnU1	RT10	11	✓	✓	✓	✓
JnU1	ST1	29	✓	✓	✓	✓
JnU1	TT10	23	✓	✓	✓	✓
JnU1	YT1	9	✓	✓	✓	✓
JnU1	GG/GW115	35	✓			
JnU2	GG/GW148	4	✓			

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