Soil name: Jacobs

Overview

Jacobs soils occupy about 400 ha on tidal estuary margins from the Aparima River estuary to Waikawa. They are formed into estuarine sand on areas not exposed to the open sea. Soils are poorly drained, saline and frequently flooded. Present use is recreational or conservation reserve with some areas used for rough grazing with sheep and cattle. Climate is cool with prevailing winds from the south.

Soil classification

NZ Soil Classification (NZSC):	Saline Recent Gley; stoneless; silty over sandy
Previous NZ Genetic Classification:	Saline Recent Gley

Classification explanation

The NZSC of Jacobs soils is consistent with the previous classification. The soils are poorly drained, with little profile development and are at least moderately saline. The soils are typically gravel free, and have sility topsoils overlying sand.

Soil phases and variants

Identified units in the Jacobs soils are:

- Jacobs undulating deep (JcU1): has no gravel within 90cm depth; occurs on slopes of 0–7°

The soil properties described in this Technical Data Sheet are based on the most common phase, Jacobs undulating deep (JcU1). 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 Jacobs soils are:

- Makarewa: poorly drained soil with clayey textures on the slowly accumulating floodplain
- Dacre: young poorly drained soil with silty textures and little structural development
- Invercargill: very poorly drained soil formed in deep peat

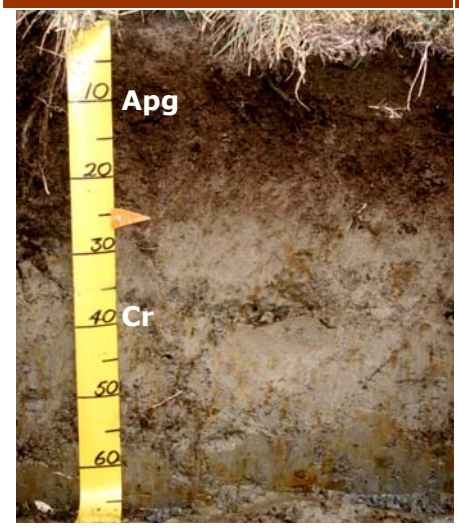
Similar soils

Some soils that have similar properties to Jacobs soils are:

- Otakau: non-saline poorly drained soil with silty overlying sand textures; occurs in the non-saline areas of the Oreti River coastal flood basin
- Grasmere: poorly drained soil with clayey textures; occurs in the non-saline areas of the Oreti River coastal flood basin.

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.

Jacobs profile	Horizon	Depth (cm)	Description
	Apg	0–25	Dark brown silt loam; few greyish red mottles; weak soil strength; strongly developed fine polyhedral structure; abundant roots.
	Cr	25–90+	Olive grey loamy sand; common bright brown mottles; weak soil strength; single grain structure; common roots.

Key profile features

Jacobs have variable deep topsoils between 10–25cm deep. In the actively flooded areas topsoil development may be absent. They typically have moderately to strongly developed fine structure in the topsoil, which grades to a structureless sand in the subsoil. The subsoil is dominated by grey colours that reflects the poor drainage of these soils.

Typical physical properties

Note: values in Italics are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Ap(g)	0–25	Low – Moderate	*Moderate*	Silt loam	Very slightly gravelly
Cr	25–65+	High	*Rapid*	Loamy sand	Gravel free

Profile drainage: Poor

Plant readily available water: *High*

Potential rooting depth: Deep

Rooting restriction: Poor aeration and high salinity may be strongly limiting to most pasture and crop species

Key physical properties

Jacobs soils have a deep rooting depth and high available water, but rooting is likely to be limited to shallow depth for most species because of the salinity. The soils are poorly drained due to the high groundwater table. Textures are silt loam in the topsoil which grades to sandy textures at depth. Topsoil clay content is about 20%, and the soils are stonefree.

Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Ap(g)	0–25	Moderate	—	—	—	—	—	—	—
Cr	25–65+	High	—	—	—	—	—	—	—

Key chemical properties

Little chemical information is available. Topsoil pH is moderate (about 6) and increases in the subsoil (high 6s) because of the high salinity.

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 poor drainage, low organic matter and P-retention.
Nutrient leaching	slight	These soils have a slight vulnerability to leaching to groundwater. This rating reflects the poor drainage and high water-holding capacity.
Topsoil erodibility by water	moderate	Due to the low clay 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	severe	These soils have a severe vulnerability to waterlogging during wet periods. This rating reflects the poor drainage.

General landuse versatility ratings for Jacobs 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.

JcU1 (Jacobs undulating deep)

Versatility evaluation for soil JcU1		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Unsuitable	Risk of flooding and salinity
Arable	Unsuitable	Risk of flooding and salinity
Intensive pasture	Unsuitable	Risk of flooding and salinity
Forestry	Unsuitable	Risk of flooding and salinity

Soil profiles available for Jacobs soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
JcU1	LT4	41	✓	✓		✓
JcU1	176/75/25	21	✓			

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Crops for Southland
PO Box 1306, Invercargill. New Zealand
www.cropssouthland.co.nz