

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.

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.



Insert soil name profile

Fertility 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.

Associated and similar 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.

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.

Sustainable management indicators

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 poor drainage.
Nutrient leaching	slight	These soils have a slight vulnerability to leaching to groundwater. This rating reflects the high water-holding capacity and slow subsoil permeability.
Topsoil erodibility by water	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.
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 and slow subsoil permeability.

General landuse versatility ratings

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.