

This Information 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. Advice 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: McLeish

Overview

McLeish soils occupy about 700 ha on the old Aparima floodplain in the Drummond district. They are formed into shallow fine alluvium over gravels that are derived from tuffaceous greywacke and basic volcanic rocks. Soils are shallow, with clayey textures, and poorly drained due to a high water table. Present use is pastoral grazing with sheep and dairy cattle and cropping. Climate is cool temperate with regular rain throughout the year. Soils rarely dry out.

Physical properties

McLeish soils have a slightly deep rooting depth and moderate plant available water, that is limited by the subsoil gravelliness. Permeability is slow, with poor aeration due to the high water table. Textures are silty clay grading to coarser loamy sands at depth. Topsoil clay content is 35–40% with a slight to moderate gravel content. Subsoils are very to extremely gravelly.



McLeish profile

Fertility properties

Topsoil organic matter levels are about 12%, P-retention 40% and pH moderate (low 6s). Cation exchange values are high and base saturation very high. Topsoil available calcium levels are very high with magnesium and potassium levels moderate. Subsoils tend to have moderate available cations, except potassium, which is low. Soil reserve phosphorus levels are low. Micronutrient levels are generally adequate.

Associated and similar soils

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

- Caroline: shallow to moderately deep poorly drained soil with a cemented pan in the gravels
- Braxton: deep to moderately deep poorly drained soil

Some soils that have similar properties to McLeish soils are:

- Lumsden: has silty rather than clayey topsoil textures.
- Otepuni: forming predominantly into quartz gravels on stream floodplains of the Southland Plain

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	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 poor drainage, offset by the moderate –high clay and organic matter content.
Nutrient leaching	moderate	These soils have a moderate vulnerability to leaching to groundwater. This rating reflects the poor drainage and slow permeability, offset by the moderate water-holding capacity.
Topsoil erodibility by water	minimal	Due to the moderate to high clay and organic matter content, topsoil erodibility in these soils is minimal. Erodibility is highly dependent on management, particularly when there is no vegetation cover.
Organic matter loss	severe	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

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.

MIU3 (McLeish undulating shallow)

Versatility evaluation for soil MIU3		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Limited	Aeration limitations; restricted rooting depth.
Arable	Limited	Aeration limitations; vulnerability to short-term waterlogging after heavy rain
Intensive pasture	Limited	Vulnerability to short-term waterlogging after heavy rain
Forestry	Limited	Aeration limitations; restricted rooting depth.

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 use should be minimised during these periods.
- Installation of sub-surface 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.