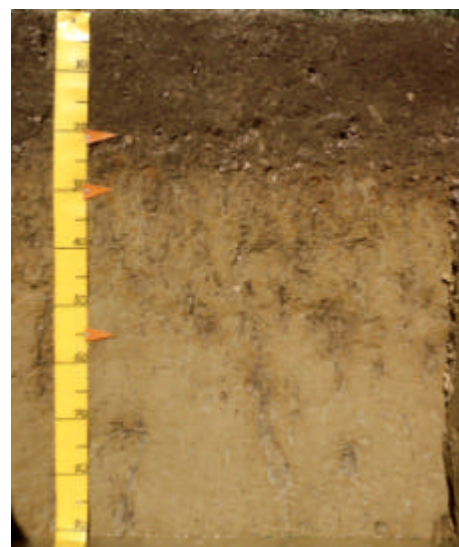


This Information Sheet describes the *typical average properties* of the specified soil. It is essentially a summary of information obtained from one or more profiles of this soil that were examined and described during the Topoclimate survey or previous surveys. It has been prepared in good faith by 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: **Mokotua**

Overview

Mokotua soils occupy about 17,700 ha on high terraces and old marine terraces of the southern Southland plains between Invercargill and the Maitua River, and on similar surfaces in the lower Makarewa and Oreti rivers. They are formed in deep wind-deposited loess derived from greywacke and schist rocks. Mokotua soils are strongly mottled, have imperfect drainage tending towards being poorly drained, and are associated with soils showing podzolised features on the southern Southland plains. The soils have a deep rooting depth, high water holding capacity, and have silt loam textures. They are used for intensive pastoral farming with sheep, dairy and some cropping. They have a cool temperate climate and receive regular rain over the year and seldom dry out.



Mokotua profile

Physical properties

Mokotua soils have a deep rooting depth and high plant available water, meaning there is no major physical barrier to root growth. The compact subsoil is slowly permeable, and causes short-term waterlogging and limits aeration during wet periods. Texture is silt loam in all horizons, with topsoil clay content of 20-35%, and the soils are typically stonefree.

Fertility properties

Topsoil organic matter levels range from 7 to 16%; P-retention values 45-70% in the topsoil, tending to increase in the subsoil (60-80%); pH values are moderate; Cation exchange values are moderate but base saturation low, indicating low availability of cations that are present. Natural reserves of phosphorus are low and there are high levels of sulphate sulphur in the subsoil. Soils respond well to lime and phosphorus. Micro-nutrient levels are generally adequate, although molybdenum responses in legumes and boron responses in brassicas can occur.

Associated and similar soils

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

- Dacre: poorly drained soil on floodplains of streams and minor drainage channels
- Waikiwi: occurs on the same landforms, but is well drained
- Kapuka: podzolised moderately deep soil on marine terraces
- Tisbury: occurs on same landforms but are poorly drained

Some soils that have similar properties to Mokotua soils are:

- Woodlands: has a firm structureless subsoil; not as strongly mottled, imperfectly tending to moderately well drained
- Ashers: deep podzolised soil on marine terraces
- Haldane: imperfectly drained soil also associated with soils with podzolised features on hilly land west of the Maitua River, from Waimahaka to the south coast.

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	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 topsoil P-retention and organic matter levels, but is offset by the imperfect drainage.
Nutrient leaching	slight	These soils have a slight vulnerability to leaching to groundwater. This rating reflects the imperfect drainage, high water-holding capacity and slow subsoil permeability.
Topsoil erodibility by water	slight	Due to the topsoil clay percentage and organic matter levels, the topsoil erodibility of 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	moderate	These soils have a moderate vulnerability to waterlogging during wet periods. This rating reflects the imperfect drainage and slowly permeable subsoil.

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.

MtU1 (Mokotua undulating deep)

MtR1 (Mokotua rolling deep)

Versatility evaluation for soil MtU1, MtR1		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Limited	Inadequate aeration during wet periods.
Arable	Limited	Inadequate aeration during wet periods; rolling slopes on rolling phase.
Intensive pasture	Moderate	Inadequate aeration during wet periods; risk of short-term waterlogging after heavy rain.
Forestry	Moderate	Inadequate aeration during wet periods; risk of short-term waterlogging after heavy rain.

MtH1 (Mokotua hilly deep)

Versatility evaluation for soil MtH1		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Unsuitable	Hilly slope
Arable	Unsuitable	Hilly slope
Intensive pasture	Limited	Hilly slope
Forestry	Moderate	Inadequate aeration during wet periods; hilly slope

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 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 depth and moisture content can be of benefit.