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. The characteristics of the soil at a specific location may differ in some details from those described here.

Topoclimate Southland Soil Technical Data Sheet No. **3**

Soil name: Mataura

Overview

Mataura soils occupy about 53,000 ha on the accumulating floodplains of rivers in southern, northern and eastern Southland and west Otago. They are formed in moderately deep to deep fine alluvium derived from schist and greywacke rock. Mataura soils are typically free draining, with occasional depression areas that have imperfect drainage. They have a good rooting depth, and typically loamy silt to silt loam texture. Mataura soils are suitable for a wide range of farming activities but can be dry over summer in northern Southland in some years, which would restrict pasture or crop growth.

Soil classification

NZ Soil Classification (NZSC):	Typic Fluvial Recent: stoneless; silty
Previous NZ Genetic Classification:	Recent

Classification explanation

The NZSC of Mataura soils is consistent with previous classifications. The soils are formed in fluvial sediments and have topsoil development, but no B horizon has developed in the subsoil. Mataura soils are typically well drained, moderately deep to deep, and have silt loam to loamy silt textures.

Soil phases and variants

Identified units in the Mataura soils are:

- Mataura undulating deep (MaU1): has no gravel within 90cm and slopes of 0-7º
- Mataura undulating deep, imperfectly drained variant (MaU1vi): has imperfect drainage, no gravel within 90cm and slopes of 0-7º
- Mataura undulating moderately deep (MaU2): has gravel between 45 and 90cm depth and slopes of 0-7º
- Mataura undulating moderately deep, imperfectly drained variant (MaU2vi): has imperfect drainage, has gravel between 45 and 90cm depth and slopes of 0-7º

The soil properties described in this Technical Data Sheet are based on the most common phase, Mataura undulating deep (MaU1). Values for other phases and variants can be taken as being similar.

Associated soils

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

- Riversdale: Recent soil on the floodplain, but has gravel at less than 45cm depth
- Jacobstown: moderately deep to deep, poorly drained soils due to high groundwater
- Howe: on active floodplain; variable soils due to active flooding

Similar soils

Some soils that have similar properties to Mataura soils are:

- Ardlussa: on slowly accumulating floodplain; show significant B horizon development
- Otikerama: Recent soils formed into tuffaceous greywacke alluvium from Hokonui Hills
- Pomahaka: formed in dominantly schist alluvium on the Clutha River

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.

Insert soil name profile	Horizon	Depth (cm)	Description
	Ap	0-25	Dark greyish-brown silt loam; weak soil strength; moderately developed fine polyhedral structure; many roots
	AB	25-36	Light yellowish-brown silt loam; many wormcasts; weak soil strength; weakly developed fine polyhedral structure; many roots
	BC	36-47	Light yellowish-brown silt loam; weak soil strength; massive structure; many roots
	C	47-100	Light yellowish-brown to light brownish-grey silt loam; weak soil strength; massive structure; few roots

Key profile features

Mataura soils have a moderately to weakly structured topsoil, 20-30cm deep. Subsoils show little weathering or development, and are generally structureless. Commonly there are layers of sand in the subsoil. There is good root distribution throughout the profile.

Typical physical properties

Note: values in Italics are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Ap	0-25	Moderate	*Moderate*	Silt loam	Gravel free
AB	25-36	Moderate	*Moderate*	Silt loam	Gravel free
BC	36-47	Moderate	*Moderate*	Silt loam	Gravel free
C	47-100	Moderate	*Moderate*	Silt loam	Gravel free

Profile drainage: Well drained
Plant readily available water: *High*
Potential rooting depth: Deep
Rooting restriction: No major limitation

Key physical properties

Mataura soils have deep rooting depth, and high plant available water. Textures are typically silt loam to loamy silt, with 10-20% clay in the topsoil. The moderately deep phase will have gravel between 45 and 90cm depth, and will have lower water holding capacity and increased permeability.

Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Ap	0-25cm	Moderate	Low	Low	Very high	Moderate	Low	Very low	Low
AB	25-36	Moderate	Low	Low	Very high	Moderate	Low	Very low	Very low
BC	36-47	Moderate	Low	Low	Very high	Low	Low	Very low	Very low
C	47-100	High	Very low	Very low	High	Very low	Very low	Very low	Very low

Key chemical properties

Topsoil organic matter levels are 4-7%; P-retention values 10-20%; pH values above 5.5 down the profile, with an ocassional slight increase below 55cm. Cation exchange is low and base saturation high, indicating high availability of nutrient cations that are present. Reserves of phosphorus and sulphur are low, and moderate levels of reserve potassium were indicated from one profile analysis. 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
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 low clay and P-retention in the topsoil, which results in low structural stability.
Nutrient leaching	Moderate	These soils have a moderate vulnerability to leaching to ground water. The vulnerability reflects the moderate permeability and high water holding capacity.
Topsoil erodibility by water	Moderate	Due to the low clay content, the topsoil erodibility of these soils is moderate. Erodibility is highly dependent on management, especially 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., cultivation practices and crop residue management)
Waterlogging	Slight	These soils have a slight vulnerability to waterlogging during wet periods. This rating reflects the good drainage and moderate permeability. The imperfectly drained variant will have moderate vulnerability to waterlogging.

General landuse versatility ratings for Mataura 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.

MaU1 (Mataura undulating deep)
MaU1vi (Mataura undulating deep, imperfectly drained variant)
MaU2 (Matura undulating moderately deep)
MaU2vi (Mataura undulating moderately deep, imperfectly drained variant)

Versatility evaluation for soil MaU1, MaU2, MaU1vi, MaU2vi		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Limited	Risk of flooding in some rivers.
Arable	Moderate	Vulnerable to nutrient leaching and structural degradation by long-term intensive cultivation
Intensive pasture	Moderate	Vulnerable to nutrient leaching and structural degradation by compaction
Forestry	Limited	Risk of flooding in some rivers.

Management practices that may improve soil versatility

- Mataura soils would benefit from flood protection for intensive landuses.
- Cultivation and intensive stocking or vehicular traffic should be minimised during wet periods
- Long-term cultivation should be carefully managed to minimise structural degradation
- Organic matter levels should be carefully maintained and enhanced
- Management of nutrient applications that minimise leaching losses

Soil profiles available for Mataura soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
MaU1	M3161	24	✓	✓	✓	
MaU1	G522	4	✓	✓	✓	
MaU2	CT6	6	✓	✓	✓	✓
MaU1vi	H8	3	✓	✓	✓	✓
MaU1	150/75/30	7	✓			
MaU2vi	GMT10	27	✓	✓	✓	✓

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