

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. 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. Advise 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: **Tuatapere**

Overview

Tuatapere soils occupy 6,500 ha on the slowly accumulating floodplains and low terraces of the Waiau and Aparima river catchments. They are formed in mixed alluvium derived from the Takitimu, Fiordland, and Livingstone Mountains. The soils are well drained, with good rooting depth and water holding capacity. They are silty to loamy textured soils, and contain variable amounts of gravel below 45 cm. Tuatapere soils are suitable for a range of farming activities and receive regular summer rain.

Soil classification

NZ Soil Classification (NZSC):

Typic Orthic Melanic; soils with stones; silty over skeletal

Previous NZ Genetic Classification:

Recent

Classification explanation

The NZSC is different from the previous classifications, as Tuatapere soils typically have developed a well-structured B horizon, reflecting their position on the slowly accumulating floodplain and low terraces. Tuatapere soils have dark coloured topsoils, with moderate to strong structure in the topsoil and upper B horizons. They typically have silty textures overlying gravel at 45–90cm depth. The profile form does vary, reflecting the parent material and flooding history of individual rivers. The soils on the Aparima River tend to have mafic properties, and Recent soils may be found on accumulating parts of the floodplain.

Soil phases and variants

Identified units in the Tuatapere soils are:

- Tuatapere undulating deep (TjU1): has no gravel within 100cm and slopes of 0–7°
- Tuatapere undulating deep, imperfectly drained variant (TjU1v): has imperfect drainage, no gravel within 100m and slopes of 0–7°
- Tuatapere undulating moderately deep (TjU2): has gravel between 45 and 100cm and slopes of 0–7°
- Tuatapere undulating moderately deep imperfectly drained variant (TjU2v): Has imperfect drainage, gravel between 45–100cm and slopes of 0–7°

The soil properties described in this Technical Data Sheet are based on the most common phase, Tuatapere undulating moderately deep (TjU2). Values for other phases and variants can be taken as being similar.

Associated soils

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

- Drummond: occur on low to intermediate terraces; commonly have subsoil pH <5.5; and more clayey textures
- Waiau: shallow soils with gravel at less than 45cm depth.
- Upukerora: occur on the active accumulating floodplain; mostly shallow soils, but are variable due to the flood history

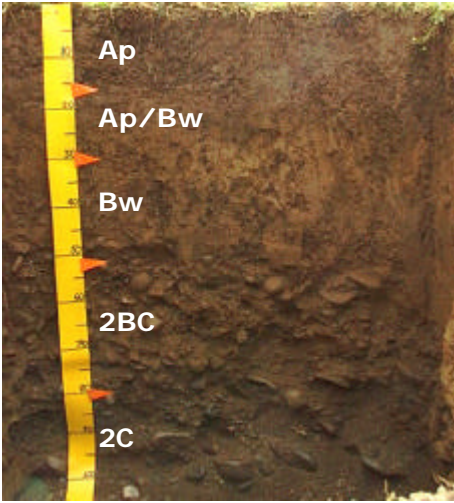
Similar soils

Some soils that have similar properties to Tuatapere soils are:

- Winton: Pallic soils with clayey textures on slowly accumulating floodplain and low terraces of the lower Oreti River
- Ardlussa: Brown soils from schist and greywacke alluvium on the slowly accumulating floodplain and low terraces of the upper Oreti, Mataura, and Pomahaka rivers
- Mataura soils: Recent soils from schist and greywacke alluvium on the accumulating floodplain of the Oreti, Mataura, and Pomahaka rivers

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.

Tuatapere profile	Horizon	Depth (cm)	Description
	Ap	0–16	Brownish black silt loam; weak soil strength; strongly developed fine polyhedral structure; abundant roots.
	Ap/Bw	16–30	Brownish black silt loam; many worm casts; weak soil strength; strongly developed fine to medium polyhedral structure; abundant roots
	Bw	30–52	Dull yellow brown very slightly gravelly silt loam; slightly firm soil strength; moderately developed medium blocky structure; abundant roots
	2BC	52–81	Dull yellowish brown very gravelly loamy sand; loose particle packing; massive structure; gravels rounded and unweathered; many roots
	2C	81–100	Extremely gravelly loamy sand; loose particle packing; single grain structure; gravels rounded and unweathered; few roots

Key profile features

Tuatapere soils have dark coloured topsoils 20–30cm deep, with strongly developed structure. Upper soil horizons to a depth of 50cm have moderately developed structure, with varying amounts of gravel below this. Subsoil colours vary from yellow-brown to dark brown, depending on the influence of volcanic parent material. Roots are well distributed to at least 50cm, only becoming limited by extremely gravelly horizons.

Typical physical properties

Note: values in *Italics* are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Ap	0–16	Moderate	<i>Moderate</i>	Silt loam	Gravel free
Ap/Bw	16–30	Moderate	<i>Moderate</i>	Silt loam	Gravel free
Bw	30–52	Moderate – High	<i>Moderate</i>	Silt loam	Very slightly gravelly
2BC	52–81	N/A	<i>Rapid</i>	Loamy sand	Very gravelly
2C	81–100	N/A	<i>Rapid</i>	Loamy sand	Extremely gravelly

Profile drainage: Well drained
Plant readily available water: *High*
Potential rooting depth: Moderately deep
Rooting restriction: Gravel below 45cm depth

Key physical properties

This soil has a good rooting depth and high water-holding capacity. The soil is well drained and has good aeration. Soils have a silt loam texture in upper horizons, with topsoil clay percentage of 20–30%. Varying amounts of gravel occurs below 45cm, with occasional stones in the topsoil.

Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Ap	0–16	Moderate	Moderate	High	High	High	Moderate	Very low	Moderate
Ap/Bw	16–30	High	Moderate	High	High	High	Moderate	Very low	Low
Bw	30–52	High	Moderate	Moderate	High	Moderate	Moderate	Low	Low
2BC	52–81	High	Moderate	Moderate	High	Moderate	Moderate	Very low	Low
2C	81–100	High	Moderate	Moderate	High	Low	Low	Very Low	Low

Key chemical properties

Topsoil organic matter levels are 5–8%; P-retention values 30–60%; pH values are high (>5.8) in all horizons; moderate to high cation exchange and high base saturation values. Reserves of phosphorus, potassium and sulphur are low and soils respond well to these nutrients. Micro-nutrient levels are generally satisfactory.

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 risk 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 good drainage, moderate P-retention, and topsoil clay content.
Nutrient leaching	Severe	These soils have a severe vulnerability to leaching to groundwater. This rating reflects the moderate total available water. Deep phases are likely to have moderate vulnerability.
Topsoil erodibility by water	Slight	Due to the silty clay 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	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 a moderate vulnerability.

General landuse versatility ratings for Tuatapere 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.

TjU1 (Tuatapere undulating deep)

TjU1vi (Tuatapere undulating deep imperfectly, drained variant)

TjU2 (Tuatapere undulating moderately deep)

TjU2vi (Tuatapere undulating moderately deep, imperfectly drained variant)

Versatility evaluation for soil TjU1, TjU1vi, TjU2, TjU2vi		
Landuse	Versatility rating	Main limitation
Non-arable Horticulture	Moderate	Intermittent flooding and vulnerability to leaching to groundwater
Arable	Moderate	Intermittent flooding and vulnerability to leaching to groundwater
Intensive Pasture	Moderate	Intermittent flooding and vulnerability to leaching to groundwater
Forestry	Limited	Flood risk over rotation of forest

Management practices that may improve soil versatility

- Mataura soils would benefit from flood protection for intensive landuses.
- Management of nutrient applications that minimise leaching losses.
- Organic matter levels should be carefully maintained and enhanced

Soil profiles available for Tuatapere soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
TjU1	MT8	7	✓	✓	✓	✓
TjU1	SB09865	8	✓	✓	✓	
TjU1	SB7814	39	✓			
TjU1	149/75/5	38	✓			
TjU1	ZT2	43	✓	✓	✓	✓
TjU1	YT15	9	✓	✓	✓	✓
TjU1vi	168/71/8	8	✓			
TjU2	141/74/1	39	✓			
Tju2	AT7	39	✓	✓	✓	✓
TjU2	CLT4	17	✓	✓	✓	✓
TjU2	KT11	5	✓	✓	✓	✓

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