

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: Otahuti

### Overview

Otahuti soils occupy about 1000 ha on low terraces on the central Southland plain south of Drummond. They are formed in moderately deep to deep fine alluvium derived from tuffaceous greywacke and volcanic rocks. The soils are well drained, with good potential rooting depth, high water-holding capacity and heavy silt loam to silty clay textures. Present use is intensive pastoral grazing with sheep, dairy and deer production and some cropping. They have a cool temperate climate and receive regular rain over the year, soils seldom dry out.

### Soil classification

**NZ Soil Classification (NZSC):**

Typic Orthic Brown; stoneless; clayey over silty.

**Previous NZ Genetic Classification:**

Yellow-brown earth to Brown-granular loam intergrade

### Classification explanation

The NZSC of the Otahuti soils is consistent with the previous classification, but the soils have been classified as Orthic Brown rather than Mafic Brown (Drummond soils) because there is little evidence of mafic parent material influencing soil properties. Otahuti soils have subsoils with no major rooting barrier, are stone free, and have clayey textured topsoils grading to silt loam in the subsoil.

### Soil phases and variants

Identified units in the Otahuti soils are:

- Otahuti undulating deep (OuU1): has no gravel within 90cm depth; occurs on slopes of 0–7°
- Otahuti undulating moderately deep (OuU2): has gravel between 45 and 90cm depth; occurs on slopes of 0–7°

The soil properties described in this Technical Data Sheet are based on the most common phase, Otahuti undulating deep (OuU1). Values for other phases and variants can be taken as being similar. Where they differ significantly they are recorded with a separate versatility rating, e.g., Otahuti undulating moderately deep (OuU2).

### Associated soils

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

- Braxton: moderately deep to deep, poorly drained soil with no fragipan
- Pukemutu: deep, poorly drained soil due to water perching on a fragipan
- McLeish: shallow, poorly drained soil

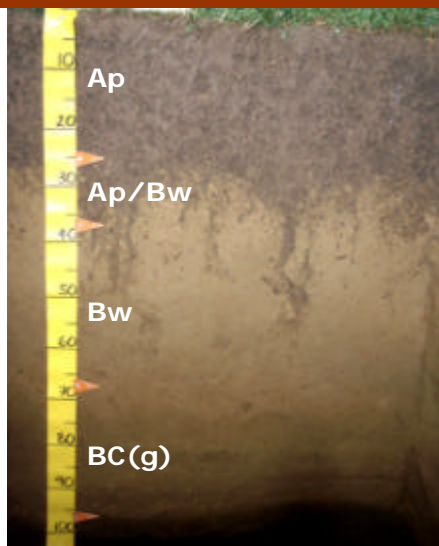
## Similar soils

Some soils that have similar properties to Otahuti soils are:

- Drummond: has soil properties that reflect a significant influence of Mafic parent material
- Ardlussa: has intergrade properties between Pallic and Brown soils; has silty textures throughout
- McGaw: imperfectly drained equivalent of the Otahuti soil

## 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.

Otahuti profile	Horizon	Depth (cm)	Description
	Ap	0–25	Brownish black silty clay; slightly firm soil strength; strongly developed very fine to medium polyhedral structure; many roots.
	Ap/Bw	25–37	Dull yellowish brown silt loam; many worm casts; slightly firm soil strength; moderately developed very fine to medium polyhedral structure; many roots
	Bw	37–67	Dull yellowish brown silt loam; few worm casts; slightly firm soil strength; weakly developed very coarse prismatic and fine to medium polyhedral structure; common roots
	BC(g)	67–90+	Brown loamy silt; weak soil strength; massive structure; few roots

## Key profile features

Otahuti topsoils are 20–25cm deep with a moderate to strongly developed structure. Subsoils have moderate to weak structure, with weak soil strength, that results in good root distribution. The dull yellow-brown colours of the subsoil reflect the minimal influence that mafic parent materials have on these soils.

## Typical physical properties

Note: values in *Italics* are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Ap	0–25	Moderate – High	<i>Moderate</i>	Silty clay	Gravel free
Ap/Bw	25–37	Moderate	<i>Moderate</i>	Silt loam	Gravel free
Bw	37–67	Moderate – High	<i>Moderate</i>	Silt loam	Gravel free
BC(g)	67–90+	Moderate – High	<i>Moderate</i>	Silt	Gravel free

<b>Profile drainage:</b>	Well
<b>Plant readily available water:</b>	<i>High</i>
<b>Potential rooting depth:</b>	Deep
<b>Rooting restriction:</b>	No major restriction

## Key physical properties

Otahuti soils have a deep rooting depth and high plant available water, with no major restriction to root growth. They are well drained, with good aeration and permeability throughout the profile. Textures are silty clay grading to silt loam in the subsoil, with a topsoil clay content of about 35–40%. Deeper soils contain no stones, but moderately deep soils contain gravel below 45cm that may limit the rooting depth and water holding capacity.

## Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Ap	0–25	Moderate	High	Moderate	High	High	Low	Very low	Low
Ap/Bw	25–37	Moderate	High	Moderate	Moderate	Moderate	Very low	Very low	Low
Bw	37–67	Moderate	High	Low	Moderate	Low	Very low	Very low	Low
BC(g)	67–90+	Moderate	Moderate	Moderate	Moderate	Moderate	Very low	Very low	Low

## Key chemical properties

Topsoil organic matter levels are about 7%; P-retention 50–80% with pH moderate (high5s). Cation exchange is moderate with base saturation high. Available calcium levels are high with magnesium and potassium levels low. Reserve phosphorus levels are low. Micronutrient 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
<b>Structural compaction</b>	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, high P-retention and clay content.
<b>Nutrient leaching</b>	moderate	These soils have a moderate vulnerability to leaching to groundwater. This rating reflects the good drainage and moderate permeability, offset by the high water-holding capacity.
<b>Topsoil erodibility by water</b>	slight	Due to the high clay content, topsoil erodibility in these soils is slight. Erodibility is highly dependent on management, particularly when there is no vegetation cover.
<b>Organic matter loss</b>	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).
<b>Waterlogging</b>	slight	These soils have a slight vulnerability to waterlogging during wet periods. This rating reflects the good drainage and permeability.

## General landuse versatility ratings for Otahuti 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.

### OuU1 (Otahuti undulating deep)

Versatility evaluation for soil OuU1		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	High	No major limitation
Arable	High	No major limitation
Intensive pasture	Moderate	Vulnerability to leaching to ground water
Forestry	High	No major limitation

### OuU2 (Otahuti undulating moderately deep)

Versatility evaluation for soil OuU2		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Moderate	Restricted rooting depth.
Arable	High	No major limitation
Intensive pasture	Moderate	Vulnerability to leaching to ground water
Forestry	Moderate	Restricted rooting depth.

### Management practices that may improve soil versatility

- Management of nutrient applications so as to minimise leaching losses
- Clayey textures in the topsoil may be limiting for harvesting of root crops during wet conditions

## Soil profiles available for Otahuti soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
OuU1	IT 17	8	✓	✓	✓	✓
OuU2	176/71/1	8	✓			

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