

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: **Chatton**

Overview

Chatton soils occupy 4000 ha on rolling downlands north of Gore. They are formed into windblown loess overlying old and strongly weathered gravelly alluvium. They are moderately deep, moderately well drained soils, with silt loam texture. Present use is pastoral farming with sheep, dairy and deer with some cropping. Regular rain occurs though soils can be seasonally dry in some summers.

Soil classification

NZ Soil Classification (NZSC):

Typic Firm Brown; soils with stones; silty over skeletal

Previous NZ Genetic Classification:

Moderately leached yellow-brown earth

Classification explanation

The NZSC of Chatton soils is consistent with the previous classification. These are moderately well drained, moderately weathered soils, with a compact gravelly subsoil below 45cm depth. The gravels are commonly quartz, although weathered greywacke gravels are equally abundant. The soils typically have silty texture, although the gravelly layer is more clayey.

Soil phases and variants

Identified units in the Chatton soils are:

- Chatton hilly moderately deep (CtH2): has gravel between 45 and 90cm depth; occurs on slopes of 15-25°
- Chatton undulating moderately deep (CtU2): has gravel between 45 and 90cm depth; occurs on slopes of 0-7°
- Chatton rolling moderately deep (CtR2): has gravel between 45 and 90cm depth; occurs on slopes of 7-14°
- Chatton steep moderately deep (CtS2): has gravel between 45 and 90 cm depth; occurs on slopes >25°

The soil properties described in this Technical Data Sheet are based on the most common phase, Chatton hilly moderately deep (CtH2). 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., Chatton undulating moderately deep (CtU2).

Associated soils

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

- Waikoikoi: has no gravels within 90cm depth; poorly drained with a subsoil fragipan.
- Benio: shallow soil with gravels through the profile.
- Jacobstown: poorly drained floodplain soil
- Arthurton: imperfectly drained soil formed in deep loess; shows Brown-Pallic intergrade properties

Similar soils

Some soils that have similar properties to Chatton soils are:

- Oteramika: predominantly shallow soils forming on terrace shoulders and sideslopes in southern Southland
- Wairaki: occurs on high terraces and fans from the Takitimu mountains. Formed in tuffaceous greywacke alluvium

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.

Chatton profile	Horizon	Depth (cm)	Description
	0-15	Ap	Greyish yellow brown slightly gravelly silt loam; slightly firm soil strength; moderately developed fine to medium polyhedral structure; gravels moderately weathered and rounded; abundant roots.
	15-35	Ap/Bw	Dull yellow orange slightly gravelly silt loam; many worm casts; slightly firm soil strength; strongly developed fine to medium polyhedral structure; gravels moderately weathered and rounded; many roots.
	35-72	Bw(g)	Bright yellowish brown moderately gravelly silt loam; few light yellow mottles; few worm casts; slightly firm soil strength; moderately developed very fine to medium polyhedral structure; gravels moderately weathered and rounded; many roots.
	72-90	2BC	Bright yellowish brown very gravelly clay loam; slightly firm soil strength; massive; gravels moderately weathered and rounded; many roots.

Key profile features

Chatton soils have a 15-25cm deep topsoil that has a moderately developed structure. Subsoil structure is also moderately developed and grades to massive in the gravelly subsoil layer.

Typical physical properties

Note: values in *Italics* are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Ap	0-15	Moderate	Moderate	Silt loam	Slightly gravelly
Ap/Bw	15-35	Moderate	Moderate	Silt loam	Slightly gravelly
Bw(g)	35-72	Moderate – High	Moderate	Silt loam	Moderately gravelly
2BC	72-90	Moderate – High	Slow	Clay loam	Very gravelly

Profile drainage:	Moderately well
Plant readily available water:	Moderately high
Potential rooting depth:	Moderately deep
Rooting restriction:	Very gravelly subsoil

Key physical properties

Chatton soils have a moderately deep rooting depth and moderately high plant available water. The soils are moderately well drained, but have slow permeability in the lower subsoil. Textures are silt loams, with clay loams occurring in the gravelly subsoil (below 45cm depth). Topsoil clay content is 20-30%. Stones and gravel are present in the subsoil and can occasionally occur in the topsoil.

Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Ap	0-15	Low	Moderate	Moderate	Low	Very low	Moderate	Moderate	Low
Ap/Bw	15-35	Low	Moderate	Moderate	Very low	Very low	Low	Very low	Low
Bw(g)	35-72	Moderate	Moderate	Low	Very low	Very low	Low	Very low	Low
2BC	72-90	Moderate	Low	Low	Very low	Very low	Very low	Very low	Low

Key chemical properties

Topsoil organic matter levels are 5-6%; P-retention values 30-40% and pH values low (mid 5s). Cation exchange values are moderate in the topsoil, but base saturation is low. Available calcium levels are low and magnesium and potassium levels moderate. Natural reserves of phosphorus are low. Micronutrient levels are generally adequate although boron responses in brassicas and molybdenum responses in legumes can be expected.

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	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 moderate clay content and P-retention values.
Nutrient leaching	moderate	These soils have a moderate vulnerability to leaching to groundwater. This rating reflects the good drainage that is offset by the moderately high water-holding capacity.
Topsoil erodibility by water	slight	Due to the moderate organic matter and clay content, 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 moderate drainage and slow subsoil permeability.

General landuse versatility ratings for Chatton 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.

CtH2 (Chatton hilly moderately deep)

Versatility evaluation for soil CtH2		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Unsuitable	Hilly slopes
Arable	Unsuitable	Hilly slopes
Intensive pasture	Limited	Hilly slopes
Forestry	Moderate	Hilly slopes; restricted rooting depth

CtU2 (Chatton undulating moderately deep)

Versatility evaluation for soil CtU2		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Moderate	Risk of short-term waterlogging after heavy rain; restricted rooting depth
Arable	Moderate	Risk of short-term waterlogging after heavy rain
Intensive pasture	Moderate	Restricted subsoil root penetrability
Forestry	Moderate	Restricted rooting depth

CtR2 (Chatton rolling moderately deep)

Versatility evaluation for soil CtR2		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Moderate	Risk of short-term waterlogging after heavy rain; restricted rooting depth
Arable	Limited	Rolling slopes
Intensive pasture	Moderate	Restricted subsoil root penetrability
Forestry	Moderate	Restricted rooting depth

CtS2 (Chatton steep moderately deep)

Versatility evaluation for soil CtS2		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Unsuitable	Steep slopes
Arable	Unsuitable	Steep slopes
Intensive pasture	Limited	Steep slopes
Forestry	Limited	Steep slopes

Management practices that may improve soil versatility

- Care with intensive grazing to minimise pugging when soils are excessively wet.
- Management of nutrient applications that minimise leaching losses

Soil profiles available for Chatton soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
CtS2	TT11	23	✓	✓	✓	✓
CtR2	GG/GW54	35	✓			

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