

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: Dacre

Overview

Dacre soils occupy about 13,200ha on floodplains of minor streams of the Southland plain between the Oreti River and Tokanui. They are formed into fine alluvium from rewashed loess. These soils are moderately deep to deep, poorly drained, and have silty textures. They are used in association with adjacent well drained soils for intensive pastoral farming with sheep, dairy and deer. Climate is cool temperate with regular rain, so soils are often wet.

Soil classification

NZ Soil Classification (NZSC): Acidic Recent Gley; stoneless; silty

Previous NZ Genetic Classification: Gley soil

Classification explanation

The NZSC for Dacre soils is consistent with the previous classification. The soils are poorly drained due to a high groundwater table, and young enough to show limited profile development. The soils are typically stone free, have silty textures, and acidic subsoils with pH of less than 5.5.

Soil phases and variants

Identified units in the Dacre soils are:

- Dacre undulating deep (DcU1): has no gravels within 90cm; occur on slopes of 0–7°.
- Dacre undulating moderately deep (DcU2): has gravels between 45 and 90cm; occurs on slopes of 0–7°

The soil properties described in this Technical Data Sheet are based on the most common phase, Dacre undulating deep (DcU1). Values for other phases and variants can be taken as being similar.

Associated soils

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

- Otanomomo: very poorly drained peat soils
- Otepuni: shallow, poorly drained soil on quartz gravels
- Tisbury: poorly drained gley soil, formed in loess on terraces
- Woodlands: imperfectly drained soil formed in loess on terraces.

Similar soils

Some soils that have similar properties to Dacre soils are:

- Titipua: has over-thickened slightly peaty topsoils
- Jacobstown: has a more developed structure with silty textures
- Caroline: has a cemented ironpan in the subsoil.
- Makarewa: has a clayey subsoil with greater structural development.

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.

Dacre profile	Horizon	Depth (cm)	Description
	Apg	0–19	Greyish yellow-brown silt loam; common greyish yellow-brown mottles; weak soil strength; moderately developed medium polyhedral structure; abundant roots.
	bApg	19–33	Black silt loam; common reddish brown mottles; weak soil strength; moderately developed medium polyhedral structure; many roots.
	bApg/Cr	33–45	Brownish grey silt loam; common orange mottles; abundant wormcasts; slightly firm soil strength; moderately developed medium polyhedral structure; many roots
	bCr	45–90	Grey silt loam; common orange mottles; very few worm casts; slightly firm soil strength; massive structure; few roots

Key profile features

Dacre soils have a 20–30cm deep topsoil which has a moderately developed structure. Subsoils are typically structureless. Topsoil colours are usually dark brown, and the dominance of grey colours throughout the subsoil reflects the poor drainage of the soils. Buried topsoils are also a common feature of these soils.

Typical physical properties

Note: values in *Italics* are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Apg	0–19	Moderate	<i>Moderate</i>	Silt loam	Gravel free
bApg	19–33	Moderate	<i>Moderate</i>	Silt loam	Gravel free
bApg/Cr	33–45	Moderate – Hi	<i>Moderate</i>	Silt loam	Gravel free
bCr	45–90	High	<i>Slow</i>	Silt loam	Gravel free

Profile drainage:	Poor
Plant readily available water:	<i>High</i>
Potential rooting depth:	Deep
Rooting restriction:	Limited subsoil aeration during sustained wet periods

Key physical properties

Dacre soils have a deep rooting depth and high available soil water, although the rooting depth may be limited by poor aeration during wet periods due to the poor drainage and slow subsoil permeability. Texture is typically silt loam and topsoil clay content is 20–30%. The soils are typically stone free, although the moderately deep phase will have gravels between 45–90cm depth.

Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Apg	0–19	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Very low	Low
bApg	19–33	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Very low	Low
bApg/Cr	33–45	Low	Moderate	Moderate	Low	Low	Low	Very low	Low
bCr	45–90	Low	Low	Very low	High	Low	Low	Very low	Low

Key chemical properties

Topsoil organic matter levels are variable and range from 6 to 16%; P-retention values 25–50%; pH values moderate and low in the subsoil. Cation exchange values are moderate, grading to low in the subsoil, while base saturation values are high in the subsoil. Available magnesium and potassium are low, as are soil reserve phosphorus levels. 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	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 poor drainage, which is offset by the moderate topsoil organic matter and P-retention levels.
Nutrient leaching	slight	These soils have a slight vulnerability to leaching to groundwater. This rating reflects the high water holding capacity and slow subsoil permeability.
Topsoil erodibility by water	slight	Due to the medium 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	severe	These soils have a severe vulnerability to waterlogging during wet periods. This rating reflects the poor drainage and slow subsoil permeability.

General landuse versatility ratings for Dacre soils

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.

DcU1 (Dacre undulating deep)

DcU2 (Dacre undulating moderately deep)

Versatility evaluation for soil DcU1, DcU2		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Limited	Inadequate aeration during wet periods; risk of short-term waterlogging after heavy rain.
Arable	Limited	Inadequate aeration during wet periods; risk of short-term waterlogging after heavy rain.
Intensive pasture	Moderate	Inadequate aeration during wet periods; risk of short-term waterlogging after heavy rain.
Forestry	Limited	Inadequate aeration during wet periods; potential flood risk.

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 heavy vehicular traffic should be minimised during these periods.
- Installation and maintenance of subsurface mole and tile drains will reduce the risk of short-term waterlogging.
- If compaction occurs, aeration at the correct moisture content and depth can be of benefit.

Soil profiles available for Dacre soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
DcU1	CT10	6	✓	✓	✓	✓
DcU1	CT11	6	✓	✓	✓	✓
DcU1	ET14	28A	✓	✓	✓	✓
DcU1	IT1	8	✓	✓	✓	✓
DcU1	JT10	21	✓	✓	✓	✓
DcU1	LT12	41	✓	✓	✓	✓
DcU1	UT9	14	✓	✓	✓	✓
DcU1	GG/WD 22	14	✓	✓		
DcU1	GG/WD 4	14	✓	✓		

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Crops for Southland
PO Box 1306, Invercargill. New Zealand



www.cropssouthland.co.nz