

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: **Nokomai**

### Overview

Nokomai soils occupy about 900 ha on high terraces in the Garston district of northern Southland. They are formed into near-source wind-deposited loess from the Mataura flood plain. Nokomai soils are well drained, have a deep rooting depth, high water holding capacity, and loamy silt textures. Present use is pastoral farming with sheep and beef cattle grazing and occasional cropping. Climate is cold in the winter and summers are often dry, when soils can be moisture deficient.

### Soil classification

**NZ Soil Classification (NZSC):**

Typic Immature Pallic; stoneless; silty

**Previous NZ Genetic Classification:**

Intergrade yellow-grey / yellow-brown earth.

### Classification explanation

The NZSC of the Nokomai soil is consistent with the previous classification. The soils are only weakly weathered, with pale colours (hue 2.5Y to 5Y) and P-retention values of <30%. Nokomai soils are moderately well drained and have a subsoil horizon that is structureless and compacted sufficiently that it may limit root penetration and permeability. The soils are typically stone-free and have loamy silt textures to 90cm depth.

### Soil phases and variants

Identified units in the Nokomai soils are:

- Nokomai undulating deep (NoU1): has no gravel within 90cm depth; occurs on slopes of 0–7°
- Nokomai undulating moderately deep (NoU2): 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, Nokomai undulating deep (NoU1). Values for other phases and variants can be taken as being similar. Where they differ significantly they are recorded with a separate versatility rating.

### Associated soils

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

- Arthurton: imperfectly drained deep Brown soil; has intergrade properties between Pallic and Brown soils; has dominantly silt loam textures
- Athol: poorly drained, deep Pallic soil
- Pukerangi: well drained, moderately deep fan soil
- Berwen: well drained, shallow fan soil

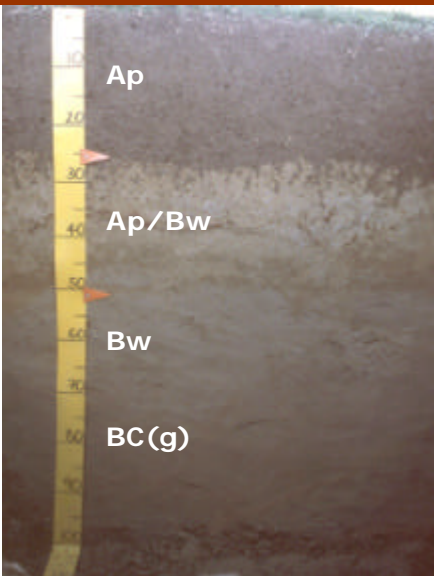
## Similar soils

Some soils that have similar properties to Nokomai soils are:

- Otama: very similar, but has bands of accumulated clay in the subsoil
- Crookston: well drained deep Brown soil; has intergrade properties between Pallic and Brown soils; has dominantly silt loam textures
- Tuturau: well drained deep Brown soil; has intergrade properties between Pallic and Brown soils; has dominantly loamy silt textures.

## 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.

Nokomai profile	Horizon	Depth (cm)	Description
	Ap	0–21	Dark greyish brown silt loam; slightly firm soil strength; weakly developed medium blocky structure; many roots
	Ap/Bw	21–44	Light yellowish brown loamy silt; common worm casts; slightly firm soil strength; weakly developed very fine blocky and fine polyhedral structure; many roots
	Bw	44–70	Pale olive loamy silt; many light grey sand coats; firm soil strength; massive structure; common roots
	BC(g)	70–90	Pale olive loamy silt; common light grey and few olive yellow mottles; many white sand coats; firm soil strength; massive structure; few roots

## Key profile features

Nokomai soils have topsoils 20–25cm deep with weakly developed structure. Subsoils also have weakly developed structure that becomes more compact and structureless below 50cm depth. The weak weathering of the soils is reflected in the pale olive colour that becomes paler with depth.

## Typical physical properties

Note: values in *Italics* are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Ap	0–21	<i>Moderate – High</i>	<i>Moderate</i>	Silt loam	Gravel free
Ap/Bw	21–44	<i>Moderate – High</i>	<i>Moderate</i>	Loamy silt	Gravel free
Bw	44–70	<i>High</i>	<i>Slow</i>	Loamy silt	Gravel free
BC(g)	70–90+	<i>High</i>	<i>Slow</i>	Loamy silt	Gravel free

<b>Profile drainage:</b>	Moderately 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

Nokomai soils have a deep rooting depth and high plant available water, although the firm lower subsoil may limit root growth. The soils are moderately well drained but the compact subsoil is slowly permeable, and may cause short-term waterlogging after heavy rainfall. Texture is light silt loam in the topsoil, and loamy silt in the subsoil. The topsoil clay content is 20–25%. Nokomai soils are typically stone free, although the moderately deep phases have gravels between 45 and 90cm depth that may restrict rooting depth and reduce available water status to moderately high.

## Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Ap	0–21	Low	Low	Low	Moderate	Low	Very low	Very low	Low
Ap/Bw	21–44	Low	Moderate	Very low	Low	Very low	Very low	Very low	Low
Bw	44–70	Low	Low	Very low	Low	Very low	Very low	Very low	Very low
BC(g)	70–90+	Low	Low	Very low	Low	Very low	Very low	Very low	Low

## Key chemical properties

Topsoil organic matter content is about 5.5%; P-retention <30% and topsoil pH low (low 5s). Subsoil pH levels are also low. Cation exchange and base saturation values are low, as are available calcium, magnesium and potassium levels. Soil reserves of phosphorus are also low. Micronutrient levels are generally adequate, although molybdenum responses in legumes and boron responses in brassicas can occur.

## 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>	severe	These soils have a severe vulnerability to structural degradation by long-term cultivation, or compaction by heavy stocking and vehicles. This rating reflects the low P-retention, organic matter and clay content.
<b>Nutrient leaching</b>	moderate	These soils have a moderate vulnerability to leaching to groundwater. This rating reflects the high water holding capacity, offset by the moderately well drained classification.
<b>Topsoil erodibility by water</b>	moderate	Due to the low organic matter and clay content, topsoil erodibility in these soils is moderate. Erodibility is highly dependent on management, particularly when there is no vegetation cover.
<b>Organic matter loss</b>	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).
<b>Waterlogging</b>	slight	These soils have a slight vulnerability to waterlogging during wet periods. This rating reflects the moderately well drained classification.

## General landuse versatility ratings for Nokomai 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.

### NoU1 (Nokomai undulating deep)

### NoU2 (Nokomai undulating moderately deep)

Versatility evaluation for soil NoU1, NoU2		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Moderate	Vulnerability of topsoil to structural degradation by cultivation and compaction; risk of short-term water logging after heavy rain.
Arable	Moderate	Vulnerability of topsoil to structural degradation by cultivation and compaction; risk of short-term water logging after heavy rain.
Intensive pasture	Moderate	Vulnerability of topsoil to structural degradation by cultivation and compaction; risk of short-term water logging after heavy rain.
Forestry	Moderate	Vulnerability of topsoil to structural degradation by cultivation and compaction; vulnerability of the topsoil to erosion by water

### Management practices that may improve soil versatility

- Careful management after heavy rain and wet periods will reduce the impact of short-term water logging and structural compaction. Intensive stocking, cultivation and heavy vehicular traffic use should be minimised during these periods.
- Over-cultivation of dry soils may allow erosion by wind and water.

## Soil profiles available for Nokomai soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
NoU1	G157	4	✓	✓	✓	✓

Published by Crops for Southland with financial support from Environment Southland.

### Copyright © 2002, Crops for Southland

This Technical Data Sheet may be reproduced in whole or in part and in any form for educational or non-profit purposes without special permission from the copyright holder, provided acknowledgement of the source is made. Crops for Southland and Environment Southland would appreciate receiving a copy of any publication that uses this Technical Data Sheet as a source.

No use of this Technical Data Sheet may be made for resale or for any other commercial purpose whatsoever without prior permission in writing from Crops for Southland.

Crops for Southland  
PO Box 1306, Invercargill, New Zealand



[www.cropssouthland.co.nz](http://www.cropssouthland.co.nz)