

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: Paretai**

## Overview

Paretai soils occur on the accumulating floodplain of the lower Clutha River. They are formed into moderately deep to deep fine alluvium from dominantly schist rocks. These soils are poorly drained, with deep rooting depth and high plant available water capacity. Texture is variable, but dominantly loamy silt, with coarser textured sandy loams to sands common. Present use is pastoral grazing with sheep, beef and dairy cattle and occasional cropping. Climate is temperate with regular rainfall though summers can be dry.

## Soil classification

**NZ Soil Classification (NZSC):**

Typic Recent Gley; stoneless; silty

**Previous NZ Genetic Classification:**

Gley Recent

### Classification explanation

The NZSC for Paretai soils is consistent with the previous classification. The soils are poorly drained due to a high groundwater table, and accumulation of sediment is sufficient that the soils have a young profile with little subsoil development. The soils are typically stone free, and have loamy silt textures.

## Soil phases and variants

Identified units in the Paretai soils are:

- Paretai undulating deep (PaU1): has no gravel within 90cm depth; occurs on slopes of 0–7°
- Paretai undulating deep, peaty subsoil variant (PaU1vo): has a peaty subsoil; has no gravel within 90cm depth; occurs on slopes of 0–7°

The soil properties described in this Technical Data Sheet are based on the most common phase, Paretai undulating deep (PaU1). 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 Paretai soils are:

- Pomahaka: well drained soil with no subsoil development on the accumulating floodplain
- Clutha: well drained soil with a weathered subsoil on the slowly accumulating floodplain
- Pukeawa: well drained shallow soil, with less than 45cm to the underlying bedrock

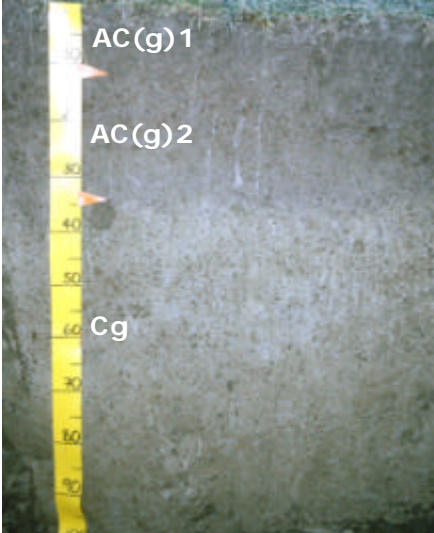
## Similar soils

Some soils that have similar properties to Paretai soils are:

- Jacobstown: occurs on slowly accumulating floodplains of southern rivers and streams; formed into mixed greywacke and schist alluvium; typically has subsoil 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.

| Paretai profile  | Horizon | Depth (cm) | Description  |
|--|---------|------------|--|
|  | AC(g)1  | 0–11       | Yellowish grey loamy silt; common grey and few brown mottles; weak soil strength; weakly developed fine to medium polyhedral structure; abundant roots |
|  | AC(g)2  | 11–34      | Yellowish grey loamy silt; many grey and few brown mottles; weak soil strength; massive structure; abundant roots                                      |
|  | Cg      | 34–90      | Grey loamy silt; common brown and few dull yellow-orange mottles; slightly firm soil strength; massive structure; common roots                         |

## Key profile features

Paretai soils have a moderately to weakly structured topsoil, 15–30cm deep. Subsoils show little weathering or development and are generally structureless. Commonly there are layers of sand in the subsoil. The dominance of grey colours in the subsoil reflects the poor drainage of these soils. The peaty subsoil variant will have a buried peat layer at between 45 and 90cm depth.

## Typical physical properties

Note: values in *Italics* are estimates

| Horizon | Depth (cm) | Bulk density    | Permeability    | Texture    | Gravel content |
|---------|------------|-----------------|-----------------|------------|----------------|
| AC(g)1  | 0–11       | Moderate – High | <i>Moderate</i> | Loamy silt | Gravel free    |
| AC(g)2  | 11–34      | Moderate – High | <i>Moderate</i> | Loamy silt | Gravel free    |
| Cg      | 34–90      | High            | <i>Slow</i>     | Loamy silt | Gravel free    |

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

## Key physical properties

Paretai 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 variable, but dominantly loamy silt, with coarser textured sandy loams to sands common. Topsoil clay content is about 10%.

## Typical chemical properties

| Horizon | Depth (cm) | pH | P retention | CEC | BS | Ca | Mg | K | Na |
|---------|------------|----|-------------|-----|----|----|----|---|----|
| AC(g)1  | 0–11       | —  | —           | —   | —  | —  | —  | — | —  |
| AC(g)2  | 11–34      | —  | —           | —   | —  | —  | —  | — | —  |
| Cg      | 34–90      | —  | —           | —   | —  | —  | —  | — | —  |

## Key chemical properties

The Paretai soils were not chemically analysed, but are likely to be similar to the associated Pomahaka soil.

Pomahaka soils have topsoil organic matter levels of 3–4%, P-retention 9–15% and topsoil pH moderate (high 5s). Subsoil pH values are high (high 6s). Cation exchange levels are very low and base saturation high. Available calcium levels are moderate and magnesium and potassium levels low. Soil reserve phosphorus and sulphur 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>        | very severe | These soils have a very severe vulnerability to structural degradation by long-term cultivation, or compaction by heavy stocking and vehicles. This rating reflects the poor drainage, low organic matter, clay and P-retention. |
| <b>Nutrient leaching</b>            | slight      | These soils have a slight vulnerability to leaching to groundwater. This rating reflects the slow permeability, poor drainage, and high water-holding capacity.  |
| <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>                 | severe      | These soils have a severe vulnerability to waterlogging during wet periods. This rating reflects the poor drainage and slow permeability.  |

## General landuse versatility ratings for Paretai 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.

### PaU1 (Paretai undulating deep)

### PaU1vo (Paretai undulating deep, peaty subsoil variant)

| Versatility evaluation for soil PaU1, PaU1vo |                    |  |
|--|--------------------|--|
| Landuse                                      | Versatility rating | Main limitation  |
| Non-arable horticulture                      | Limited            | Inadequate aeration during wet periods; risk of short-term waterlogging during wet periods.                            |
| Arable                                       | Limited            | Inadequate aeration during wet periods; risk of short-term waterlogging during wet periods.                            |
| Intensive pasture                            | Moderate           | Inadequate aeration during wet periods; vulnerability to topsoil structural degradation by cultivation and compaction. |
| Forestry                                     | Limited            | Inadequate aeration during wet periods, potential flood risk.  |

### Management practices that may improve soil versatility

- Pomahaka soils would benefit from flood protection for intensive landuses.
- Cultivation and intensive stocking or vehicular traffic should be minimised during wet periods
- Long-term cultivation should be carefully managed to minimise structural degradation
- Organic matter levels should be carefully maintained and enhanced
- Management of nutrient applications so as to minimise leaching losses.

## Soil profiles available for Paretai soils

| Soil symbol | Profile ID           | Topoclimate map sheet | Profile description available | Physical data available | Chemical data available | Profile photo available |
|-------------|----------------------|-----------------------|-------------------------------|-------------------------|-------------------------|-------------------------|
| –           | No profile available | –                     | –                             | –                       | –                       | –                       |

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)