This Information 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.

#### Topoclimate Southland Soil Information Sheet

No. 46

### Soil name:

## **Charlton**

#### Overview

Charlton soils occupy about 2300ha on the slowly accumulating floodplains and low terraces in the lower Mataura (south of Gore) and Pomahaka river valley (east of the Blue Mountains). They are formed into moderately deep to deep fine alluvium over gravel. These soils are imperfectly drained, silty textured, and have good rooting depth. At present they are used for intensive sheep, dairy and deer grazing with occasional cropping. Regular rain occurs throughout the year and soils seldom dry out.

# Physical properties

Charlton soils have a deep potential rooting depth with high available water. The soils are imperfectly drained, with slowly permeable subsoils that may limit aeration during wet periods. Topsoil textures are light silt loams with loamy silts in the subsoil. Sand layers can also occur at lower depths. Topsoil clay



Charlton profile

content is 20–25%. The soils are typically stone-free, but the moderately deep phase typically has gravels between 45 and 90cm depth that may reduce the rooting depth and water holding capacity.

## Fertility properties

Topsoil organic matter levels are 6–7%; P-retention 20–30%; pH values are moderate (midhigh5s). Cation exchange and base saturation values are moderate to high in the topsoil but low in the subsoil. Available calcium and magnesium levels are moderate to high, but potassium and sodium levels are low. Natural levels of phosphorus and sulphur are low. Micro nutrient levels are generally adequate.

#### Associated and similar soils

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

- Mataura: well drained, deep or moderately deep recent soils found on the accumulating floodplain
- Gore: well drained stony soils found on similar landforms
- Fleming: poorly drained due to water perching on fragipan
- Jacobstown: poorly drained due to high groundwater; silty textures.

Some soils that have similar properties to Charlton soils are:

- Ardlussa: well drained equivalent of the Charlton soils. Ardlussa imperfectly drained variant should be included in the Charlton series
- Popotunoa: well drained, deep to moderately deep Pallic soil; occurs on equivalent surfaces to the Charlton series in the lower Pomahaka river
- Northhope: imperfectly drained, deep to moderately deep Pallic soil; occurs on equivalent surfaces to the Charlton series in the lower Oreti river; has heavy silt loam texture, and shows more strongly developed subsoil structure

SIS46.doc Last updated 17/03/03

## Sustainable management indicators

**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        | 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 imperfect drainage, low P-retention and light silt loam texture. |
| Nutrient leaching            | slight   | These soils have a moderate vulnerability to leaching to groundwater. This rating reflects the high water holding capacity and slow subsoil permeability. Moderately deep phases are likely to have a moderate vulnerability.       |
| Topsoil erodibility by water | slight   | Due to the good organic matter levels, 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                 | moderate | These soils have a moderate vulnerability to waterlogging during wet periods. This rating reflects the imperfect drainage and slow permeability.  |

# General landuse versatility ratings

**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.

# CaU1 (Charlton undulating deep) CaU2 (Charlton undulating moderately deep)

| Versatility evaluation for soil CaU1, CaU2 |                    |   |  |
|--|--------------------|---|--|
| Landuse                                    | Versatility rating | Main limitation   |  |
| Non-arable horticulture                    | Moderate           | Inadequate aeration during wet periods; vulnerability to topsoil structural degradation by cultivation and compaction     |  |
| Arable                                     | Moderate           | Inadequate aeration during wet periods; vulnerability to topsoil to structural degradation by cultivation and compaction. |  |
| Intensive pasture                          | Moderate           | Inadequate aeration during wet periods: vulnerability to leaching to groundwater  |  |
| Forestry                                   | Limited            | 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 minimal during these periods.
- Installation of subsurface mole and tile drains will reduce the risk of short-term waterlogging.

#### Copyright © 2002, Crops for Southland

www.cropssouthland.co.nz

This Information 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 Information Sheet as a source. No use of this Information Sheet may be made for resale or for any other commercial purpose whatsoever without prior permission in writing from Crops for Southland.