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. 29

Soil name:

Freestone

Overview

Freestone soils occupy about 700 ha on outwash terraces of the Waiau river southwest of Manapouri township. They are formed in fine gravelly alluvium derived from Fiordland rocks. They are moderately deep to deep, very well drained soils, with moderately deep rooting depth, moderately high water holding capacity, and sandy loam textures. They are used for pastoral farming with sheep and beef cattle and are recognised as having cropping potential. Climate is cold in the winter and summers can occasionally be dry, when soils can dry out.

Physical properties

Freestone soils have a moderately deep rooting depth with moderately high plant-available water. They are well drained, with good aeration and permeability. Textures are loamy silts to sandy loams, and the topsoil clay content of 15–20%. The soils



Freestone profile

typically have gravels between 45 and 90cm. The deep phase has no gravels within 90cm depth, and has a deep rooting depth and high water-holding capacity.

Fertility properties

Topsoil organic matter levels are about 11%; P-retention values 75% and pH values moderate, with little change in the subsoil. Cation exchange values are moderate and base saturation low, with both properties grading to very low in the subsoil. Available magnesium, potassium, and sodium levels are very low. Reserve phosphorus levels are low, with high P-retention values compounding this. Micro-nutrient levels are generally adequate.

Associated and similar soils

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

- Monowai soils: occur on the same surface, but are shallow, stony soils
- · Otanomomo: very poorly drained peat soils
- Te Anau: shallow and moderately deep soils forming on moraines
- Manapouri: deep, poorly drained due to a high groundwater table

Some soils that have similar properties to Freestone soils are:

- Mararoa: forming into loess on fans and terraces; has silty textures
- Tuatapere: formed into younger alluvium on floodplains and low terraces; has more varied soil properties depending on the age and parent material influence
- Ardlussa: forming into alluvium of rivers in northern Southland; has silty textures and lower Pretentions.

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 | minimal | These soils have a minimal vulnerability to structural degradation by long-term cultivation, or compaction by heavy stocking and vehicles. This rating reflects the good drainage, high organic matter and P-retention levels. |
| Nutrient leaching | moderate | These soils have a moderate vulnerability to leaching to groundwater. This rating reflects the good drainage and permeability, but is offset by the moderately high waterholding capacity. |
| Topsoil erodibility by water | minimal | Due to the topsoil clay percentage, the topsoil erodibility of these soils is minimal compared to other Southland soils. Erodibility is highly dependent on management, particularly when there is no vegetation cover. |
| Organic matter loss | minimal | 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 good drainage and 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.

FsU2 (Freestone undulating moderately deep)

| Versatility evaluation for soil FsU2 | | | | |
|--------------------------------------|--------------------|---|--|--|
| Landuse | Versatility rating | Main limitation | | |
| Non-arable horticulture | Moderate | Restricted rooting depth | | |
| Arable | High | No major limitations | | |
| Intensive pasture | Moderate | Vulnerability to nutrient leaching to groundwater | | |
| Forestry | Moderate | Restricted rooting depth. | | |

FsU1 (Freestone undulating deep)

| • | J 17 | | | | |
|--------------------------------------|--------------------|---|--|--|--|
| Versatility evaluation for soil FsU1 | | | | | |
| Landuse | Versatility rating | Main limitation | | | |
| Non-arable horticulture | High | No major limitations | | | |
| Arable | High | No major limitations | | | |
| Intensive pasture | Moderate | Vulnerability to nutrient leaching to groundwater | | | |
| Forestry | High | No major limitations | | | |

Management practices that may improve soil versatility

- Management of nutrient applications so as to minimise leaching losses
- Can be seasonally dry in some years, with irrigation of benefit for growth.

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.