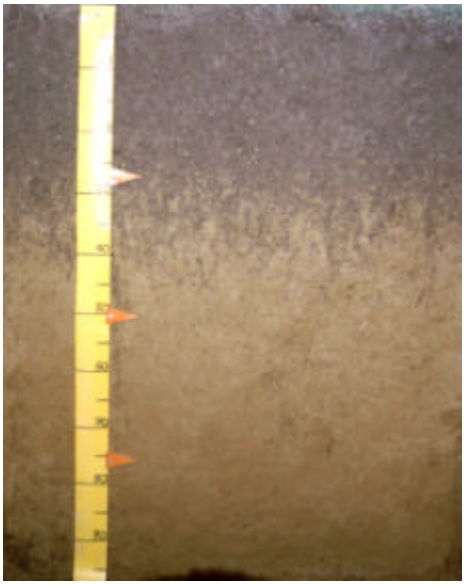
Soil name: Chaslands

Overview

Chaslands soils occupy about 7,300ha on hilly and rolling land east of the Mataura River, south of Mataura. They are formed in loess derived from greywacke and schist which overlays tuffaceous greywacke rock. Chaslands soils are imperfectly drained, have a deep rooting depth, high water holding capacity, and have heavy silt loam textures with P-retention of 50–85%. They are primarily used for intensive sheep and beef production. Climate is cool temperate with reliable summer rainfall.



Chaslands profile

Physical properties

Chaslands soils have a deep rooting depth and high plant available water, meaning there is no major physical barrier to root growth. The compact subsoil is slowly permeable, and may cause short-term waterlogging and limit aeration after heavy rainfall. Texture is heavy silt loam in all horizons, with topsoil clay content of 25–36%, and the soils are typically stone free. The clayey variant has silty clay textures and topsoil clay content of 35–40%.

Fertility properties

Topsoil organic matter levels are 6-10%; P-retention values 50–80%, higher in the subsoil; pH values are moderate and mostly consistant down the profile. Cation exchange and base saturation values are very low, as are the available cations calcium, magnesium and potassium. Reserve phosphorus levels are low and sulphate sulphur levels high in the subsoil. Micro-nutrient levels are generally adequate.

Associated and similar soils

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

- Tokanui: well drained equivalent of the Chaslands soils
- Scrubby Hill: occurs above 100m altitude in the hilly land southeast of Waimahaka, but is more leached and has podzolised and acidic properties, high P-retention and thin iron pans.
- Fortification: moderately deep on the underlying bedrock; strongly leached with P-retention of >85%.

Some soils that have similar properties to Chaslands soils are:

- Haldane: similar profile form, but has a structured subsoil throughout the profile, and pH of less than 5.5 in the subsoil; occurs in complexes with strongly leached soils above 100m altitude in the hilly land southeast of Waimahaka;
- Ferndale: similar profile form, but has pH of less than 5.5 in the subsoil; occurs in the rolling and hilly land between Mataura and Clinton.
- Woodlands: similar profile but occurs on terraces on the Southland plains
- Fortrose: occurs in near-source loess adjacent to the Mataura river; has loamy silt subsoil textures.

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	slight	These soils have a slight vulnerability to structural degradation by long-term cultivation, or compaction by heavy stocking and vehicles. This rating reflects the high topsoil clay and P-retention values, but is offset by the imperfect drainage.
Nutrient leaching	slight	These soils have a slight vulnerability to leaching to groundwater. This rating reflects the imperfect drainage, high water holding capacity and slow subsoil permeability.
Topsoil erodibility by water	slight	Due to the topsoil clay percentage, the topsoil erodibility of these soils is slight. 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	moderate	These soils have a moderate vulnerability to waterlogging during wet periods. This rating reflects the imperfect drainage and slowly peremable subsoil.

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.

ChR1 (Chaslands rolling deep; ChR1vc (Chaslands rolling deep clayey variant)

Versatility evaluation for soil ChR1, ChR1vc.		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Moderate	Inadequate aeration during wet periods; rolling slopes.
Arable	Limited	Rolling slopes
Intensive pasture	Moderate	Inadequate aeration during wet periods; rolling slopes.
Forestry	Moderate	Vulnerable to sustained waterlogging

ChU1 (Chaslands undulating deep); ChU1vc (Chaslands undulating deep clayey variant)

Versatility evaluation for soil ChU1, ChU1vc.		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Moderate	Inadequate aeration during wet periods; risk of short-term waterlogging after heavy rainfall
Arable	Moderate	Inadequate aeration during wet periods; risk of short- term waterlogging after heavy rainfall
Intensive pasture	Moderate	Inadequate aeration during wet periods; risk of short-term water logging after heavy rainfall.
Forestry	Moderate	Vulnerable to sustained waterlogging

ChH1 (Chaslands hilly deep); ChS1 (Chaslands steep deep)

Versatility evaluation for soil ChH1, ChS1		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Unsuitable	Hilly slopes
Arable	Unsuitable	Hilly slopes
Intensive pasture	Limited	Hilly slopes
Forestry	Moderate	Hilly slopes; (ChH1 also vulnerable to sustained waterlogging)

Management practices that may improve soil versatility

- Careful management after heavy rainfall and wet periods will reduce the impact of short-term waterlogging. Intensive stocking, cultivation and vehicular traffic should be minimised during these periods.
- Installation and maintenance of subsurface drainage with moles and tiles may reduce the risk of short-term waterlogging.