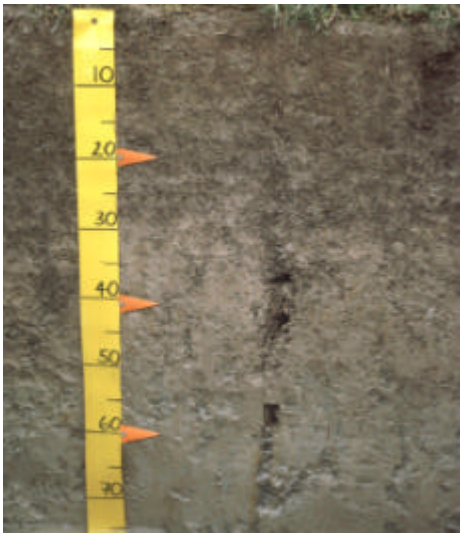
Soil name: Wyndham

Overview

Wyndham soils occupy about 4,000 ha on terraces and downs on the east side of the Mataura River between Gore and Waimahaka. They are formed into near-source loess from the Mataura River that is derived from schist and greywacke rock. Wyndham soils are imperfectly drained, have a deep rooting depth, high water-holding capacity, and loamy silt textures with P-retention between 25 and 50%. Present use is pastoral farming with sheep beef and dairy cattle and some deer. Climate is cool temperate with regular rainfall. Soils rarely dry out.



Wyndham profile

Physical properties

Wyndham soils have a deep rooting depth with high plant available water. the soils are imperfectly drained due to the slow permeability of the lower subsoil This may limit aeration during wet periods. Texture is light silt loam in the topsoil and loamy silt in the subsoil, with topsoil clay content of 15–25%. Soils contain no gravel.

Fertility properties

Topsoil organic matter levels are 5–8%; P-retention 25–50% and pH moderate (low 6s). Topsoil cation exchange and base saturation values are both moderate. Available calcium and potassium values are moderate and magnesium values low. Soil reserve phosphorus levels are low. Micronutrient levels are generally adequate.

Associated and similar soils

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

- Tuturau: well drained equivalent of the Wyndham soil
- Tokanui: well drained soil that occurs on rolling to hilly land in more distal source loess; has heavy silt loam texture and is more weathered, with yellow-brown colours and P-retention of 60–80% throughout the profile.
- Jacobstown: poorly drained floodplain soil, due to a high groundwater table

Some soils that have similar properties to Wyndham soils are:

- Fortrose: similar soil south of Waimahaka; shows greater weathering, with higher P-retention, and found in complexes with soils that show podzolised properties.
- Chaslands: imperfectly drained soil that occurs on rolling to hilly land in more distal source loess; has heavy silt loam texture and is more weathered, with yellow-brown colours and P-retention of 60–80% throughout the profile.
- Arthurton: also has Brown to Pallic intergrade properties, but has silt loam textures throughout

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 topsoil clay, organic matter and P-retention.
Nutrient leaching	slight	These soils have a slight vulnerability to leaching to groundwater. This rating reflects the imperfect drainage and high water-holding capacity.
Topsoil erodibility by water	moderate	Due to the low clay and organic matter content, topsoil erodibility in these soils is moderate. 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 slowly permeable 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.

WmU1 (Wyndham undulating deep)

Versatility evaluation for soil WmU1		
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 structural degradation by cultivation and compaction
Intensive pasture	Moderate	Inadequate aeration during wet periods; vulnerability to topsoil structural degradation by cultivation and compaction
Forestry	Moderate	Vulnerability to topsoil structural degradation by cultivation and compaction; vulnerability to sustained waterlogging.

WmR1 (Wyndham rolling deep): as above, but rolling phase has limited versatility for arable landuse due to rolling slopes.

WmH1 (Wyndham hilly deep): unsuitable for non-arable horticulture and arable landuse, and limited versatility for intensive pasture, due to hilly slopes; moderate versatility for forestry, with same limitations as for other phases.

Management practices that may improve soil versatility

- Careful management after heavy rain and wet periods will reduce the impact of short- term water logging. Intensive stocking, cultivation and heavy vehicular traffic should be minimal during these periods.
- Intsallation and maintenance of subsurface mole and tile drains will reduce the risk of short-term waterlogging.
- Organic matter levels should be carefully maintained and enhanced