Soil name: Wendonside

Overview

Wendonside soils occupy about 1,300 ha on the Waikaia plain in northern Southland. They are formed into a moderately deep layer of loess overlying slightly weathered gravelly alluvium derived from schist and greywacke rock. Soils are well drained, with a shallow to slightly deep rooting depth, moderately high water capacity, and have a cemented pan in the underlying gravels. Present use is pastoral farming with sheep and beef grazing and some cropping. Climate is temperate, with cold winters and warm summers. Regular rainfall occurs but some years can be seasonally dry.

Wendonside profile

Physical properties

Wendonside soils have a slightly deep rooting depth (45–60cm) that is limited by the cemented subsoil gravels. Plant available water is moderately high, with good aeration and permeability throughout the soil. Textures are loamy silts in upper horizons, becoming loamy as the gravel abundance increases. Topsoil clay content is less then 20%. Topsoils are gravel free and subsoils very to extremely gravelly.

Fertility properties

Topsoil organic matter content is about 6%; P-retention 30–40%, increasing up to 80% in the underlying gravels. Soil pH values are moderate (high 5s). Cation exchange and base saturation levels are moderate in the topsoil, but low to very low in the suibsoil. Topsoil available calcium level is moderate and magnesium and potassium levels low. Soil reserve phosphorus levels are low. Micronutrient levels are generally adequate although molybdenum responses in legumes and boron responses in brassics can be occur.

Associated and similar soils

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

- Otama: low angle dunes with silty to loamy textures, and gravel below 45cm depth
- Crookston: formed in deep to moderately deep silty loess, with gravel below 45cm depth
- Arthurton: imperfectly drained deep to moderately deep soil

Some soils that have similar properties to Wendonside soils are:

- Crookston: similar to the Wendonside moderately deep, but the underlying gravels are not cemented
- Oreti: occurs where loess is less than 45cm deep (commonly less than 20cm) to the underlying gravels

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	moderate	These soils have a moderate vulnerability to structural degradation by long-term cultivation, or compaction by heavy stocking and vehicles. This rating reflects the good drainage, but moderate to low clay, organic matter and P-retention.
Nutrient leaching	moderate	These soils have a moderate vulnerability to leaching to groundwater. This rating reflects the moderate drainage and permeability, that is offset by the moderately high water retention.
Topsoil erodibility by water	slight	Due to the moderate to low clay and organic matter content, topsoil erodibility in 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	slight	These soils have a slight vulnerability to waterlogging during wet periods. This rating reflects the moderate 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.

WsU2 (Wendonside undulating moderately deep)

Versatility evaluation for soil WsU2		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Limited	Restricted rooting depth.
Arable	Moderate	Vulnerability to topsoil structural degradation by cultivation and compaction; restricted rooting depth.
Intensive pasture	Moderate	Vulnerability to topsoil structural degradation by cultivation and compaction; vulnerability to leaching to groundwater.
Forestry	Limited	Restricted rooting depth.

WsU3 (Wendonside undulating shallow)

Versatility evaluation for soil WsU3		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Limited	Restricted rooting depth.
Arable	Limited	Restricted rooting depth.
Intensive pasture	Limited	Restricted rooting depth.
Forestry	Limited	Restricted rooting depth.

Management practices that may improve soil versatility

- Management of nutrient applications that minimise leaching losses
- Long-term cultivation should be carefully managed to minimise structural degradation
- Over cultivation of dry soils in summer may allow wind erosion
- Organic matter levels should be carefully maintained and enhanced