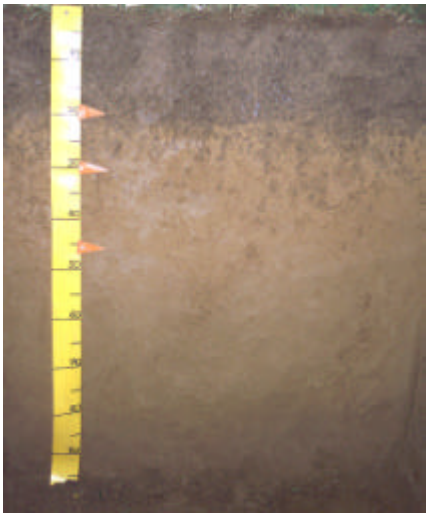
Soil name: Edendale

Overview

Edendale soils occupy 9,700 ha of land on gently sloping to undulating intermediate terraces in the lower Mataura and Oreti river valleys. They are formed in deep wind-blown loess derived from greywacke and schist rocks. Edendale soils are well drained and have a deep rooting depth, high water-holding capacity, and silt loam textures. They are high producing soils currently used for intensive sheep, dairy and deer production, with limited cropping. They have a cool temperate climate with rain over the year and seldom dry out.



Edendale profile

Physical properties

Edendale soils have a deep rooting depth and high plant-available water, meaning there is no significant physical barrier to root growth. The soils are well drained but the compact subsoil is slowly permeable, and may cause short-term waterlogging after heavy rainfall. Texture is silt loam in all horizons, with topsoil clay content of 25-30%. Edendale soils are typically stone free, although the moderately deep phases have gravels between 45 and 90cm depth that may restrict rooting depth and available water to moderately high.

Fertility properties

Topsoil organic matter levels are 10-15%, P retention values 55-75%, pH values are usually above 5.5 in all horizons, with moderate cation exchange capacity and base saturation values. Natural reserves of P, K, Mg, and S are moderate to high. Soils respond well to lime and phosphate. Potassium and nitrogen are required in intensive use situations. Micro-nutrient levels are generally adequate, although boron responses in brassicas and molybdenum responses in legumes can occur.

Associated and similar soils

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

- Mokotua: imperfectly drained soils on the same landform west of Invercargill
- Arthurton: imperfectly drained soils on the same landform in the Edendale township area
- Waikoikoi: poorly drained soils on low terraces and foot slopes of adjacent high terraces
- Jacobstown: poorly drained soils on floodplains.

Some soils that have similar properties to Edendale soils are:

- Clinton: occur on undulating fans west of Clinton township; have P-retention of 30-45% throughout profile.
- Pourakino: occur on the flanks of the Pourakino Valley; paler colours; P-retention 70-85% throughout profile.
- Waikiwi: very similar soil profile; occur on high terraces of the Southland Plains.
- Waimatuku: very similar soil profile; occur on high terraces of the Southland Plains west of the Waimatuku Stream; have a distinct subsoil fragipan.

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 good drainage and the topsoil clay and P-retention values.
Nutrient leaching	moderate	These soils have a moderate vulnerability to leaching to groundwater. This rating reflects the moderately high water-holding capacity and slow subsoil permeability offset by the good profile drainage.
Topsoil erodibility by water	slight	Due to the clay content, topsoil erodibility in 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	slight	These soils have a slight vulnerability to waterlogging during wet periods. This rating reflects the good drainage but 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 rating 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.

EdU1 (Edendale undulating deep)
EdU1vi (Edendale undulating deep, imperfectly drained variant)

Versatility evaluation for soil EdU1, EdU1vi		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Moderate	Short-term waterlogging after heavy rain
Arable	Moderate	Short-term waterlogging after heavy rain
Intensive pasture	High	Vulnerability to leaching to groundwater
Forestry	High	Few limitations

EdU2 (Edendale undulating moderately deep): as above, except that forestry landuse versatility rating is only moderate, due to restricted rooting depth.

EdR1 (Edendale rolling deep)

Versatility evaluation for soil EdR1		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Moderate	Rolling slopes; risk of short-term waterlogging after heavy rain
Arable	Limited	Rolling slopes
Intensive pasture	High	Rolling slopes; vulnerability to leaching to groundwater
Forestry	High	Few limitations

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
- If compaction occurs, aerating at the correct depth and moisture condition can be of benefit.