

Soil name: Ohai

Overview

Ohai soils occupy about 5,400 ha on rolling and hilly slopes in the Birchwood/Ohai districts of western Southland. They are formed in fine colluvium or *in situ* weathered coal measure mudstone. Ohai soils have poor drainage, deep rooting depth, moderate water-holding capacity, and clayey textures through the profile. Present use is pastoral grazing with sheep, beef cattle and some deer. Climate is cool temperate with regular rain.

Physical properties

Ohai soils have moderate plant available water and a deep rooting depth, that may be limited in some soils by the high bulk density in the lower subsoil. The rooting depth may also be limited by poor aeration during wet periods due to the poor drainage and slow subsoil permeability. Textures are silty clay to clay throughout. Topsoil clay content is 40–60%. The soils are typically stone free.



Ohai profile

Fertility properties

Topsoil organic matter levels are about 7–8%; P-retention 60% and pH values low in all horizons. Cation exchange is high and base saturation low. Available calcium levels are low and magnesium and potassium values high. Reserve phosphorus levels are low. Micronutrient 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 Ohai soils are:

- Mossburn: poorly drained, silty textured soil, with a fragipan; formed in loess
- Aparima: imperfectly drained Brown soil, with a fragipan; formed in loess
- Otikerama: well drained, shallow soil formed in old terrace gravels
- Makarewa: poorly drained, clayey soil on floodplains

Some soils that have similar properties to Ohai soils are:

- Hokonui: formed in mixed loess and fine colluvium from tuffaceous argillite
- Pukemutu: formed in loess, with a fragipan; has silty topsoils and clayey textured subsoils
- Mangapiri: formed in fine colluvium from siltstone and mudstone as well as colluvium from weathered terrace 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	minimal	These soils have minimal vulnerability to structural degradation by long-term cultivation, or compaction by heavy stocking and vehicles. This rating reflects the poor drainage, offset by the high clay content and moderate P-retention.
Nutrient leaching	slight	These soils have a slight vulnerability to leaching to groundwater. This rating reflects the poor drainage and slow permeability, offset by the moderate water-holding capacity.
Topsoil erodibility by water	minimal	Due to the high clay content and moderate organic matter level, topsoil erodibility in these soils is minimal. Erodibility is highly dependent on management, particularly when there is no vegetation cover.
Organic matter loss	moderate	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	severe	These soils have a severe vulnerability to waterlogging during wet periods. This rating reflects the poor drainage and slow permeability. The hilly phases will have a lower vulnerability.

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.

OhR1 (Ohai rolling deep)

Versatility evaluation for soil OhR1		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Limited	Inadequate aeration during wet periods; risk of short-term waterlogging after heavy rain.
Arable	Limited	Inadequate aeration during wet periods; rolling slopes.
Intensive pasture	Limited	Risk of short-term water logging after heavy rain.
Forestry	Limited	Inadequate aeration during wet periods; vulnerability to sustained waterlogging.

OhU1 (Ohai undulating deep): as above, except that, for arable landuse, risk of short-term waterlogging replaces rolling slopes as a limitation.

OhH1 (Ohai hilly deep)

Versatility evaluation for soil OhH1		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Unsuitable	Hilly slopes
Arable	Unsuitable	Hilly slopes
Intensive pasture	Limited	Risk of short-term waterlogging after heavy rain; hilly slopes
Forestry	Limited	Inadequate aeration during wet periods.

Management practices that may improve soil versatility

- Careful management after heavy rain and wet periods will reduce the impact of short-term waterlogging. Intensive stocking, cultivation and heavy vehicular traffic use should be minimised during these periods.
- Installation and maintenance of sub-surface mole and tile drains will reduce the risk of short-term waterlogging.