Soil name: Omaui

Overview

Omaui soils occupy about 600 ha on flat to hilly slopes in the Bluff/Greenhills area. They are variable soils formed into a complex of sand, loess, marine sediments and bouldery colluvium. Soils are typically poorly drained, with shallow to slightly deep rooting depth and moderately high plant available water. They have variable textures ranging from loamy silty to sandy loams. Present use is pastoral farming with sheep, beef cattle and deer. Climate is cool coastal with prevailing winds from the southerly quarter. Regular rain falls throughout the year and soils are rarely dry.

Soil classification

NZ Soil Classification (NZSC): Ironstone Orthic Gley; soils with stones; silty over sandy.
Previous NZ Genetic Classification: Humus and iron illuvial (weakly gleyed) podzols

Classification explanation

Omaui soils have been reclassified in this survey as the soil properties are more consistent with Gley soils rather than Podzols. Those soils with podzolised properties were correlated with the Waihoaka soils. Omaui soils are poorly drained with a dense root-restricting subsoil layer. Gravels commonly occur throughout the profile, and textures vary between silt loam to sand.

Soil phases and variants

Identified units in the Omaui soils are:

- Omaui rolling moderately deep (OoR2): has gravel between 45 and 90cm depth; occurs on slopes of 7–15°
- Omaui undulating moderately deep (OoU2): has gravel between 45 and 90cm depth; occurs on slopes of 0–7°
- Omaui hilly moderately deep (OoH2): has gravel between 45 and 90cm depth; occurs on slopes of 15–25°
- Omaui undulating shallow (OoU3): has gravel within 45cm depth; occurs on slopes of 0–7°
- Omaui rolling deep (OoR1): has no gravel within 90cm depth; occurs on slopes of 7–15°

The soil properties described in this Technical Data Sheet are based on the most common phase, Omaui rolling moderately deep (OoR2). Values for other phases and variants can be taken as being similar. Where they differ significantly they are recorded with a separate versatility rating, e.g., Omaui hilly moderately deep (OoH2).

Associated soils

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

- Orepuki: well drained, shallow soil formed onto bedrock within 45cm depth
- Waihoaka: moderately well drained podzolised soil, formed in deep loess
- Riverton: well drained soil, formed in deep young dune sands
- Invercargill: very poorly drained soils formed in deep peat

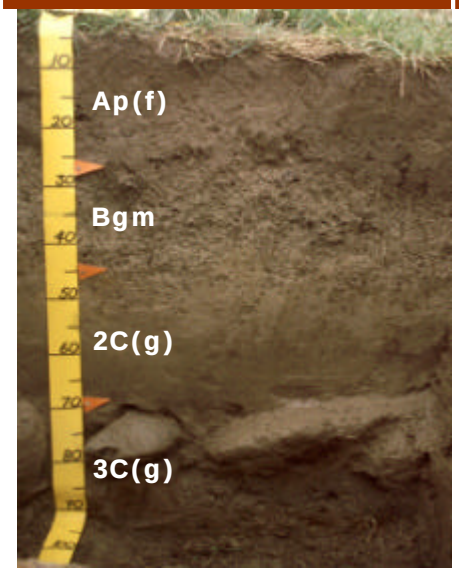
Similar soils

Some soils that have similar properties to Omaui soils are:

- No similar soils

Typical profile features

The following is a 'generic' or composite profile description representing the most common combination of characteristics for this soil type. The actual profiles for which descriptions and data are available are listed at the end of this Technical Data Sheet.

Omaui profile	Horizon	Depth (cm)	Description
	Ap(f)	0–27	Greyish yellow-brown loamy silt; few fine iron nodules; weak soil strength; strongly developed very fine polyhedral structure; abundant roots.
	Bgm	27–45	Greyish yellow loamy silt; profuse comented fine to medium iron nodules and few reddish brown mottles; very hard soil strength; massive structure; few roots.
	2C(g)	45–69	Yellow-brown loamy sand; common greyish yellow mottles; weak soil strength; single grain structure; no roots.
	3C(g)	69–90+	Greyish yellow-brown very bouldery sand; common reddish brown mottles; weak soil strength; single grain structure; no roots.

Key profile features

Omaui topsoils are 25–30cm deep with a moderate to strongly developed structure. Subsoil structure is massive with little development. The subsoils often have cemented or gravelly layers, restricting the rooting depth. The dominance of grey colours in the subsoil reflects the poor drainage of these soils. Iron nodules are acommon feature of these soils.

Typical physical properties

Note: values in Italics are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Ap(f)	0–27	Moderate	*Moderate*	Loamy silt	Gravel free
Bgm	27–45	High	*Slow*	Loamy silt	Gravel free
2C(g)	45–69	High	*Slow*	Loamy sand	Gravel free
3Cg	69–90+	—	*Slow*	Sand	Very gravelly

Profile drainage: Poor

Plant readily available water: *Moderately high*

Potential rooting depth: Slightly deep

Rooting restriction: Cemented subsoil layers, and gravels/bedrock

Key physical properties

Omaui soils have moderate to moderately high plant available water and a shallow to slightly deep rooting depth that is restricted by a cemented subsoil layer and the presence of bedrock and/or gravels. The soils are poorly drained due to the slow subsoil permeability. Texture is variable, but commonly loamy silt in the upper horizons grading to sand. Topsoil clay content is <20%. Soils contain variable layers of stones in the subsoil.

Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Ap(f)	0–27	Moderate	Moderate	High	High	Very high	High	Very high	Low
Bgm	27–45	Moderate	Moderate	Low	Moderate	Low	Moderate	Very low	Low
2C(g)	45–69	Moderate	Low	Low	Moderate	Very low	Moderate	Very low	Low
3Cg	69–90+	—	—	—	—	—	—	—	—

Key chemical properties

Topsoil organic matter content is 7–9%; P-retention 25–35% and pH moderate (high 5s). Cation exchange and base saturation values are high in the topsoil, and moderate to low in the subsoil. Topsoil available calcium, magnesium and potassium levels are high to very high, reflecting the close proximity of the sea. The subsoil has low to moderate available cations. Soil reserve phosphorus levels are low. Micronutrient levels are generally adequate.

Vulnerability to environmental degradation

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

General landuse versatility ratings for Omaui soils

Note: The versatility ratings in the table below are indicative of the major limitations for semi-intensive to intensive landuse. 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.

OoR2 (Omaui rolling moderately deep)
OoU2 (Omaui undulating moderately deep)
OoR1 (Omaui rolling deep)

Versatility evaluation for soil OoR2,OoU2,OoR1		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Limited	Inadequate aeration during wet periods; vulnerability to short-term waterlogging after heavy rain.
Arable	Limited	Inadequate aeration during wet periods; vulnerability to short-term waterlogging after heavy rain.
Intensive pasture	Limited	Vulnerability to short-term waterlogging after heavy rain.
Forestry	Limited	Inadequate aeration during wet periods; restricted rooting depth

OoU3 (Omaui undulating shallow)

Versatility evaluation for soil OoU3		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Limited	Inadequate aeration during wet periods; restricted rooting depth
Arable	Limited	Inadequate aeration during wet periods; vulnerability to short-term waterlogging after heavy rain.
Intensive pasture	Limited	Risk of short-term waterlogging after heavy rain.
Forestry	Limited	Inadequate aeration during wet periods; restricted rooting depth

OoH2 (Omaui hilly moderately deep)

Versatility evaluation for soil OoH2		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Unsuitable	Hilly slopes
Arable	Unsuitable	Hilly slopes
Intensive pasture	Limited	Hilly slopes
Forestry	Limited	Inadequate aeration during wet periods; restricted rooting depth

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 subsurface mole and tile drains will reduce the risk of sustained aeration limitations and short-term waterlogging.

Soil profiles available for Omaui soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
OoU2	LT3	41	✓	✓	✓	✓
OoU3	LT1	41	✓	✓	✓	✓

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Crops for Southland
PO Box 1306, Invercargill. New Zealand

www.cropssouthland.co.nz