Soil name: Tyneholm

Overview

Tyneholm soils occupy about 1,000 ha on rolling to steep hills below 300m altitude, east of the Mataura river from Mataura to Waimahaka. They are formed into a thin layer of loess overlying tuffaceous greywacke bedrock. Tyneholm soils are well drained, with a shallow rooting depth and moderate water holding capacity that is limited by the gravelliness and bedrock that commonly occurs within 45cm depth. Present use is pastoral farming with sheep and beef cattle. Climate is cool temperate with regular rain throughout the year.

Soil classification

NZ Soil Classification (NZSC): Typic Orthic Brown; lithic, tuffaceous sandstone; silty.
Previous NZ Genetic Classification: Moderately leached yellow-brown earth.

Classification explanation

The NZSC of Tyneholm soils is consistant with the previous classification. They are moderately leached soils with yellow-brown colours, P-retention of 50%. Tyneholm soils have silt loam textures, and tuffaceous greywacke bedrock typically occurs at less than 45cm depth

Soil phases and variants

Identified units in the Tyneholm soils are:

- Tyneholm hilly shallow (TyH3): has bedrock within 45cm depth; occurs on slopes of 15–25°
- Tyneholm undulating shallow (TyU3): has bedrock within 45cm depth; occurs on slopes of 0–7°
- Tyneholm rolling shallow (TyR3): has bedrock within 45cm depth; occurs on slopes of 7–15°
- Tyneholm steep shallow (TyS3): has bedrock within 45cm depth; occurs on slopes >25°

The soil properties described in this Technical Data Sheet are based on the most common phase, Tyneholm hilly shallow (TyH3). 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., Tyneholm undulating shallow (TyU3).

Associated soils

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

- Tokanui: well drained, deep Brown soil, with no bedrock within 90cm depth.
- Craigdale: well drained, moderately deep Brown soil, with bedrock between 45 and 90cm depth.
- Chaslands: imperfectly drained, deep Brown soil, with no bedrock within 90cm depth.

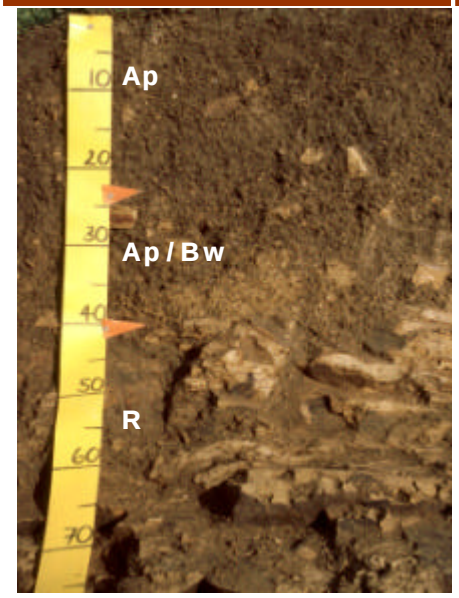
Similar soils

Some soils that have similar properties to Tyneholm soils are:

- Wendon: moderately leached Brown soil with greywacke bedrock within 45cm depth
- Mandeville: weakly leached Melanic soil with tuffaceous greywacke bedrock within 45cm depth
- Taringatura: moderately leached Brown soil with greywacke and tuffaceous greywacke bedrock and colluvium within 45cm depth; occurs on the Taringatura Mountains
- Pukerau: strongly leached Allophanic soil that is the upland equivalent of the Tyneholm soil; occurs above 300m altitude.

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.

Tyneholm profile	Horizon	Depth (cm)	Description
	Ap	0–24	Greyish yellow-brown very slightly gravelly silt loam; weak soil strength; strongly developed very fine to medium polyhedral structure; gravels moderately weathered and angular; abundant roots
	Ap/Bw	24–41	Dull yellow-orange slightly gravelly silt loam; many worm casts; weak soil strength; moderately developed very fine to medium polyhedral structure; gravels moderately weathered and angular; abundant roots
	R	41–60+	On slightly weathered tuffaceous sandstone

Key profile features

Tyneholm topsoils are about 17–24cm deep with a strongly developed structure. Subsoil structure is moderately developed and grades to coarse gravelly colluvium and bedrock within 45cm depth.

Typical physical properties

Note: values in Italics are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Ap	0–24	Moderate	*Moderate*	Silt loam	Very slightly gravelly
Ap/Bw	24–41	Moderate	*Moderate*	Silt loam	Slightly gravelly
R	41–60	—	—	—	Extremely gravelly

Profile drainage: Well

Plant readily available water: *Moderate*

Potential rooting depth: Shallow

Rooting restriction: Subsoil gravelliness and/or presence of bedrock

Key physical properties

Tyneholm soils have a shallow rooting depth, restricted by the gravelliness and bedrock in the subsoil, and moderate available water. These soils are well drained, with good aeration and permeability throughout the soil. Textures are typically silt loam, with topsoil clay content of 20–25%. The soils are gravelly throughout, and typically have at least 35% gravel within 45cm depth. Bedrock also typically occurs within 45cm depth.

Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Ap	0–24	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Low
Ap/Bw	24–41	Moderate	Moderate	Moderate	Low	Low	Low	Low	Low
R	41–60+	—	—	—	—	—	—	—	—

Key chemical properties

Topsoil organic matter levels are 9–15%; P-retention 45–55% and pH moderate (high 5s). Cation exchange and base saturation levels are moderate. Available calcium and magnesium and potassium levels are moderate. 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	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 well drained nature, with moderate clay and organic matter content.
Nutrient leaching	very severe	These soils have a very severe vulnerability to leaching to groundwater. This rating reflects the well drained nature, moderate water-holding capacity and permeability.
Topsoil erodibility by water	slight	Due to the moderate 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	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	slight	These soils have a slight vulnerability to waterlogging during wet periods. This rating reflects the good drainage and permeability.

General landuse versatility ratings for Tyneholm 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.

TyH3 (Tyneholm hilly shallow)

Versatility evaluation for soil TyH3		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Unsuitable	Hilly slopes
Arable	Unsuitable	Hilly slopes
Intensive pasture	Limited	Hilly slopes; restricted rooting depth
Forestry	Unsuitable	Shallow rock depth

TyU3 (Tyneholm undulating shallow)

Versatility evaluation for soil TyU3		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Limited	Vulnerability to leaching to groundwater; restricted rooting depth
Arable	Limited	Restricted rooting depth
Intensive pasture	Limited	Vulnerability to leaching to groundwater; restricted rooting depth
Forestry	Unsuitable	Shallow rock depth

TyR3 (Tyneholm rolling shallow)

Versatility evaluation for soil TyR3		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Limited	Vulnerability to leaching to groundwater; restricted rooting depth
Arable	Limited	Rolling slopes; restricted rooting depth
Intensive pasture	Limited	Vulnerability to leaching to groundwater; restricted rooting depth
Forestry	Unsuitable	Shallow rock depth

TyS3 (Tyneholm steep shallow)

Versatility evaluation for soil TyS3		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Unsuitable	Hilly slopes
Arable	Unsuitable	Hilly slopes
Intensive pasture	Limited	Steep slopes; restricted rooting depth
Forestry	Unsuitable	Shallow rock depth

Management practices that may improve soil versatility

- Careful management of fertiliser application to minimise leaching losses.

Soil profiles available for Tyneholm soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
TyH3	MWT26	28b	✓	✓	✓	✓
TyH3	MWT25	28b	✓	✓	✓	✓

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