

This Technical Data Sheet describes the *typical average properties* of the specified soil.

It is essentially a summary of information obtained from one or more profiles of this soil that were examined and described during the Topoclimate survey or previous surveys. It has been prepared in good faith by trained staff within time and budgetary limits. However, no responsibility or liability can be taken for the accuracy of the information and interpretations. Advise should be sought from soil and landuse experts before making landuse decisions on individual farms and paddocks. The characteristics of the soil at a specific location may differ in some details from those described here.

No warranties are expressed or implied unless stated.

Soil name: **Sobig**

Overview

Sobig soils occupy about 3,500 ha on the high fans and terraces encircling the Takitimu Mountains. They are formed into moderately deep loess which overlies weathered tuffaceous greywacke gravels. They are poorly drained soils, with heavy silt loam texture, and gravel occurring below 45cm depth. These soils respond well to drainage, fertilisers and lime and are suited to pastoral grazing.

Soil classification

NZ Soil Classification (NZSC):

Argillic Perch-gley Pallic; with stones; silty over clayey.

Previous NZ Genetic Classification:

Moderately to strongly gleyed yellow-brown earth.

Classification explanation

Sobig soils have been reclassified from the previous classification based the soil properties being more similar to Pallic soils than Brown soils. This is reflected in the firm clay enriched subsoil that is slowly permeable, and causes poor drainage due to the perching of water. Gravel typically occurs between 45 and 90cm depth, with heavy silt loam textures grading to silty clay in the subsoil.

Soil phases and variants

Identified units in the Sobig soils are:

- Sobig undulating moderately deep (SiU2): has gravel between 45 and 90cm and slopes of 0–7°
- Sobig rolling moderately deep (SiR2): has gravel between 45 and 90cm and slopes of 7–15°
- Sobig undulating shallow (SiU3): has gravel above 45cm and slopes of 0–7°

The soil properties described in this Technical Data Sheet are based on the most common phase, Sobig undulating moderately deep (SiU2). 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., Sobig rolling moderately deep (SiR2).

Associated soils

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

- Wairaki: well drained soil on the same surface
- Mangapiri: poorly drained soil formed from mixed loess and mudstone; clayey textures
- Otanomomo: peat soils

Similar soils

Some soils that have similar properties to Sobig soils are:

- Dipton: shallow soil on intermediate to high terraces
- Glenure: silty textures throughout the profile
- Braxton: dominantly deep soils on intermediate to low terraces
- Caroline: has a cemented iron pan in the subsoil

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.

ZT4 profile	Horizon	Depth (cm)	Description
	Ap	0–25	Greyish yellow-brown silt loam; few bright brown mottles; weak soil strength; strongly developed fine polyhedral structure; abundant roots
	Btg	25–59	Yellowish grey slightly gravelly silty clay; common bright brown mottles; few worm casts; weak soil strength; moderately developed fine to medium polyhedral structure; gravel strongly weathered; common roots
	2BCt(g)	59–90	Bright reddish brown very gravelly silty clay; common light grey mottles; dense particle packing; moderately developed medium prismatic structure; gravel strongly weathered; few roots

Key profile features

Sobig soils have a 20–25cm deep topsoil with moderate to strong structure. Subsoils have a moderately developed structure, with moderate to strongly weathered gravel below 45cm depth. Clay has accumulated in the subsoil, resulting in clayey textures. The greyish olive subsoil colours reflect the poor drainage, due to water perching on a dense clay-enriched subsoil horizon.

Typical physical properties

Note: values in *Italics* are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Ap	0–25	Moderate	<i>Moderate</i>	Silt loam	Gravel free
Btg	25–59	Moderate – High	<i>Slow</i>	Silty clay	Slightly gravelly
2BCt(g)	59–90	–	<i>Slow</i>	Silty clay	Very gravelly

Profile drainage: Poorly drained
Plant readily available water: *Moderately high*
Potential rooting depth: Moderately deep
Rooting restriction: Very gravelly subsoil

Key physical properties

Rooting depth is moderately deep and plant available water is moderately high, being limited by the gravelliness of the lower subsoil. Permeability is moderate, grading to slow in the dense lower subsoil. Textures grade from heavy silt loams in the topsoil to silty clay in the subsoil, with a topsoil clay content of 30–40%. Topsoils and upper subsoil are commonly slightly gravelly, with very gravelly horizons occurring between 45 and 90cm depth.

Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Ap	0–25	Moderate	Moderate	High	Moderate	High	Low	Moderate	Low
Btg	25–59	Moderate	Low	Moderate	Moderate	Moderate	Low	Very low	Low
2BCt(g)	59–90	Moderate	Low	Moderate	High	Moderate	High	Very low	Low

Key chemical properties

Topsoil organic matter levels are about 11%; P-retention values 25–40%; pH values moderate. Cation exchange capacity, base saturation and calcium levels are moderate but magnesium and potassium availability is low. Natural levels of phosphorus and sulphur are also low. Micro-nutrient levels are generally adequate, although boron responses in brassicas and molybdenum responses in legumes can occur. Responses to lime, phosphate, sulphur and potassium can be expected.

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	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 poor drainage but moderate P-retention and heavy silt loam texture in the topsoil.
Nutrient leaching	Slight	These soils have a slight vulnerability to leaching to groundwater. This rating reflects the moderately high water-holding capacity and the slow subsoil permeability.
Topsoil erodibility by water	Slight	Due to the clay content, the topsoil erodibility of 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 slowly permeable subsoil.

General landuse versatility ratings for Sobig 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.

SiU2 (Sobig undulating moderately deep)

SiU3 (Sobig undulating shallow)

Versatility evaluation for soil SiU2, SiU3		
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; risk of short-term waterlogging after heavy rain.
Intensive pasture	Limited	Risk of short-term waterlogging after heavy rain.
Forestry	Limited	Inadequate aeration during wet periods; vulnerability to sustained waterlogging.

SiR2 (Sobig rolling moderately deep)

Versatility evaluation for soil SiR2		
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 waterlogging after heavy rain.
Forestry	Limited	Inadequate aeration during wet periods; vulnerability to sustained waterlogging.

Management practices that may improve soil versatility

- Installation and maintenance of subsurface mole and tile drainage. Stony subsoils may prevent mole installation in shallow soils.
- Organic matter levels should be carefully maintained and enhanced
- Careful management after heavy rain and wet periods will reduce the impact of short-term waterlogging. Intensive stocking, cultivation and vehicle traffic should be minimised during these periods.

Soil profiles available for Sobig soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
SiU2	ZT4	43	✓	✓	✓	✓
SiU2	158/72/10	7	✓	✓		

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