Soil name: Winton

Overview

Winton soils occupy about 1,900 ha on the slowly accumulating floodplains and low terraces of the Oreti River south of Benmore in central Southland. They are formed into moderately deep to deep fine alluvium over gravel. Soils are well drained, with deep to moderately deep rooting depth, high plant available water, and have silty textures. Present use is pastoral farming with sheep, deer and dairy cows and some cropping. Climate is cool temperate with regular rain. Soils seldom dry out.

Soil classification

NZ Soil Classification (NZSC): Pedal Immature Pallic; stoneless; silty
Previous NZ Genetic Classification: Recent

Classification explanation

The NZSC of the Winton soil differs from the previous classification because the soils have significant subsoil structural development that is not typical of Recent soils. The soils are only weakly weathered, with pale colours (hue 2.5Y to 5Y) and P-retention values of <30%. Winton soils typically are structured (pedal) throughout the majority of the subsoil. The soils are typically stone free and have silt loam textures to 90cm depth

Soil phases and variants

Identified units in the Winton soils are:

- Winton undulating deep (WnU1): has no gravel within 90cm depth; occurs on slopes of 0–7°
- Winton undulating moderately deep (WnU2): has gravel between 45 and 90cm depth; occurs on slopes of 7–15°

The soil properties described in this Technical Data Sheet are based on the most common phase, Winton undulating deep (WnU1). Values for other phases and variants can be taken as being similar. Where they differ significantly they are recorded with a separate versatility rating.

Associated soils

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

- Riversdale: well drained, shallow Recent soils with gravel at less than 45cm depth; occur on the floodplain
- Gore: well drained, shallow Brown soils with gravel at less than 45cm depth; occur on low terraces
- Tomoporakau: poorly drained deep soil, due to water perching on a dense subsoil horizon
- Makarewa: poorly drained deep clayey soil, due to a high groundwater table

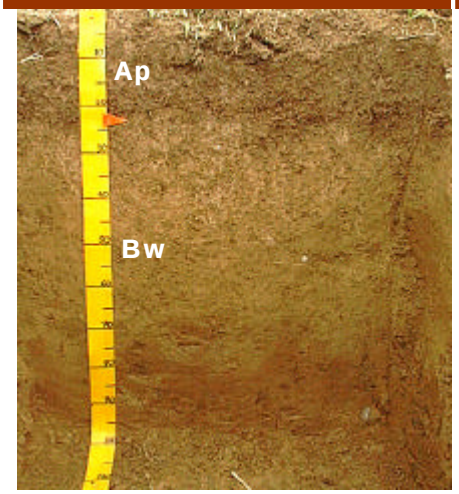
Similar soils

Some soils that have similar properties to Winton soils are:

- Ardlussa: occur on similar surfaces in northern Southland, and are typically more leached, with intergrade properties between Brown and Pallic soils
- Northope: imperfectly drained equivalent of the Winton soil

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.

Winton profile	Horizon	Depth (cm)	Description
	Ap	0–23	Dull yellowish brown silt loam; weak soil strength; moderately developed very fine to medium polyhedral structure; abundant roots
	Bw	23–90+	Dull yellowish brown very slightly gravelly silt loam; slightly firm soil strength; moderately developed very fine to coarse polyhedral structure; common roots

Key profile features

Winton topsoils are 20–25 cm deep and have a moderately developed structure. Subsoil structure is also moderately developed to 90cm, or to the underlying gravels. The yellow-brown colours of the subsoil reflect the weathered B horizon that is typical of these soils.

Typical physical properties

Note: values in Italics are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Ap	0–23	Moderate	*Moderate*	Silt loam	Gravel free
Bw	23–90+	Moderate – High	*Moderate*	Silt loam	Very slightly gravelly

Profile drainage: Well

Plant readily available water: *High*

Potential rooting depth: Deep

Rooting restriction: No major restrictions

Key physical properties

Winton soils have a deep rooting depth, with moderately deep soils having a moderately deep rooting depth. Soils have moderately high to high plant available water. Aeration and permeability are moderate throughout the profile. Texture is silt loam with topsoil clay content 25–35%. Deeper soils are stoneless with moderately deep soil havng gravel below 45cm.

Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Ap	0–23	Moderate	Moderate	Moderate	High	High	Moderate	Very low	Low
Bw	23–90+	High	Moderate	Moderate	Very high	High	Moderate	Very low	Low

Key chemical properties

Topsoil organic matter levels are 5–6%; P-retention 20–30% and topsoil pH moderate (high 5s). Subsoil pH values can be up to pH 7. Cation exchange levels are moderate and base saturation values high. Topsoil available calcium and magnesium levels are moderate to high with potassium levels low. 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	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 good drainage, offset by the low P-retention, with moderate clay and organic matter content.
Nutrient leaching	moderate	These soils have a moderate vulnerability to leaching to groundwater. This rating reflects the good drainage and permeability offset by the high water-holding capacity.
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	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	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 Winton 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.

WnU1 (Winton undulating deep)
WnU2 (Winton undulating moderately deep)

Versatility evaluation for soil WnU1, WnU2		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Moderate	Potential flood risk; subsoil root penetrability.
Arable	Moderate	Vulnerability to topsoil structural degradation by cultivation and compaction; subsoil root penetrability.
Intensive pasture	Moderate	Vulnerability to topsoil degradation by cultivation and compaction; vulnerability to leaching to groundwater.
Forestry	Limited	Potential flood risk.

Management practices that may improve soil versatility

- Longterm flood protection.
- Careful management after heavy rain and wet periods will reduce the impact of short-term water logging and structural compaction. Intensive stocking, cultivation and heavy vehicular traffic use should be minimised during these periods.
- Management practices that minimise leaching losses.

Soil profiles available for Winton soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
WnU1	XT9	13	✓	✓	✓	✓
wNu2	XT5	13	✓	✓	✓	✓

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