Soil name: Craigdale

Overview

Craigdale soils occupy 650 ha on rolling downlands in the Kaiwera district of eastern Southland. They are formed in moderately deep loess overlying tuffaceous greywacke bedrock. Craigdale soils are well drained, with a slightly deep rooting depth and moderate water-holding capacity that is limited by the gravelliness and bedrock that commonly occurs in the lower subsoil. Present use is pastoral grazing with sheep and beef cattle. Climate is cool temperate with regular rain during the year.

Craigdale profile

Physical properties

Craigdale soils have a slightly deep rooting depth and moderate water-holding capacity, restricted by the gravelliness and bedrock in the subsoil. The soils are moderately well to well drained, with permeability that may be restricted in the subsoil by the bedrock. Textures are silt loams, with topsoil clay content of 30–35%. The soils are gravelly throughout, and typically have extremely gravelly subsoil and bedrock between 45–90cm depth.

Fertility properties

Topsoil organic matter levels are 6–10%; P-retention 45–60%; and pH moderate (low–high 5s); subsoil pH can be low (low 5s). Cation exchange values are high in the topsoil and moderate in the subsoil. Base saturation is moderate. Available calcium, magnesium and potassium are moderate to high but reserves of phosphorus are low. Micro nutrient levels are generally adequate. Strong responses to super and lime can occur.

Associated and similar soils

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

- Tokonui: well drained, deep Brown soil, with no bedrock within 90cm depth.
- Chaslands: imperfectly drained, deep Brown soil, with no bedrock within 90cm depth
- Kaiwera: shallow, well drained strongly leached soil forming into stony colluvium or bedrock; has P-retention of >85%

Some soils that have similar properties to Craigdale soils are:

- McNab: Brown soil that has a strongly acid subsoil (pH <4.9); bedrock is more weathered.
- Fortification: Allophanic soil that is strongly leached, with P-retention of >85%
- Waiarikiki: Brown soil that is strongly leached, with P-retention of >85%; formed in gravelly colluvium
- Josephville: Brown soil formed into moderately deep and deep loess overlying tuffaceous greywacke bedrock and stony colluvium; the soils are only weakly leached, with P-retention of 20–40%.

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	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 good drainage, with moderate P-retention and clay content.
Nutrient leaching	severe	These soils have a severe vulnerability to leaching to groundwater. This rating reflects the good drainage, with only moderate water holding capacity.
Topsoil erodibility by water	minimal	Due to the moderate clay content, 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	slight	These soils have a slight vulnerability to waterlogging during wet periods. This rating reflects the good drainage.

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.

CrR2 (Craigdale rolling moderately deep)

Versatility evaluation for soil CrR2		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Limited	Restricted rooting depth
Arable	Limited	Rolling slope
Intensive pasture	Moderate	Restricted subsoil root penetrability; vulnerability to leaching to groundwater
Forestry	Limited	Restricted rooting depth

CrU2 (Craigdale undulating moderately deep)

Versatility evaluation for soil CrU2		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Limited	Restricted rooting depth
Arable	Moderate	Restricted rooting depth; vulnerability to leaching to groundwater.
Intensive pasture	Moderate	Restricted rooting depth; vulnerability to leaching to groundwater.
Forestry	Limited	Restricted rooting depth

CrH2 (Craigdale hilly moderately deep) and **CrS2 (Craigdale steep moderately deep):** the hilly and steep phases of this soil are unsuitable for non-arable horticulture and arable landuse and of limited versatility for intensive pasture and forestry. Hilly or steep slopes are the main limitation and, for forestry, restricted rooting depth.

Management practices that may improve soil versatility

- Management of nutrient applications that minimise leaching losses