

Soil name: **Kaweku**

Overview

Kaweku soils occupy about 4,400 ha on high terraces and adjacent scarp slopes of the Waimea plain and Knapdale districts. They are formed in a thin layer of loess overlying gravelly alluvium derived from greywacke and schist rock. They are moderately well drained shallow soils with stony subsoils. They have clayey textures in the subsoil, which retains moisture well and makes them less prone to summer droughts. Kaweku soils are suitable for pasture and cropping, being presently mostly used for sheep and cereal crop production. Seasonally dry periods over summer can be expected in some years.

Physical properties

Rooting depth is moderately deep but is limited by the subsoil gravels. Soils have moderate plant available water. Permeability is moderate and bulk density moderate to high through the profile. Textures grade from heavy silt loams in the topsoil to silty clay and clay loams in the subsoil, with the topsoil clay content of 30–40%. Topsoils are commonly slightly gravelly with very gravelly horizons occurring within 45cm depth.



Kaweku profile

Fertility properties

Topsoil organic matter levels are 5–6%; P-retention values are in the range 40–60%; pH values decrease down the profile and are below 5.3 in the subsoil. Major nutrient levels are low, with responses to phosphorus, potassium and lime. Minor elements are adequate although boron responses in brassicas and molybdenum responses in legumes occur.

Associated and similar soils

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

- Crookston: moderately deep to deep well drained soils
- Waikoikoi: moderately deep to deep; poorly drained due to fragipan
- Dipton: shallow, poorly drained equivalent of the Kaweku

Some soils that have similar properties to Kaweku soils are:

- Benio: on older high terraces; generally more leached and gravels are strongly weathered
- Oreti: occur on intermediate terraces; gravels only slightly weathered, with a cemented pan
- Wairaki: occur on high terraces and fans from the Takitimu mountains
- Oteramika: occur on shoulder and side slopes in central and southern Southland, where loess has been eroded away.

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 and compaction by intensive stocking and vehicles.
Nutrient leaching	Severe	These soils have a severe vulnerability to leaching to groundwater. This reflects the moderate water holding capacity.
Topsoil erodibility by water	Slight	Due to the low clay content of the silt loam texture, the topsoil erodibility of 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 dependant on soil properties and highly dependent on management practices (e.g., cultivation practices and crop residue management)
Waterlogging	Minimal	These soils have a minimal vulnerability to water logging during wet periods. This rating reflects the good drainage and moderate permeability.

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.

KkU3 (Kaweku undulating shallow)

Versatility evaluation for soil KkU3		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Moderate	Vulnerability to leaching to groundwater; restricted rooting depth
Arable	Moderate	Vulnerability to leaching to groundwater
Intensive pasture	Moderate	Vulnerability to leaching to groundwater
Forestry	Moderate	Rooting depth

KkR3 (Kaweku rolling shallow)

Versatility evaluation for soil KkR3		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Moderate	Rooting depth and rolling slopes
Arable	Limited	Rolling slopes
Intensive pasture	Moderate	Vulnerability to leaching to groundwater, and rolling slopes
Forestry	Moderate	Rooting depth

KkH3 (Kaweku hilly shallow)

Versatility evaluation for soil KkH3		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Unsuitable	Hilly slopes
Arable	Unsuitable	Hilly slopes
Intensive pasture	Limited	Hilly slopes
Forestry	Moderate	Rooting depth and hilly slopes

Management practices that may improve soil versatility

- Organic matter levels should be carefully maintained and enhanced
- Management of nutrient applications that minimise leaching losses