Soil name: Pebbly Hills

Overview

Pebbly Hills soils occupy about 1800 ha on rolling downs in the Pebbly Hills district. They are formed into quartz gravel deposits overlayen by a thin layer of loess. Soils are shallow and well drained, with a slightly deep rooting depth and moderate water-holding capacity. Present use is pastoral grazing with sheep and some deer and beef cattle. They have a cool temperate climate with regular rainfall.

Pebbly Hills profile

Physical properties

Pebbly Hills soils have a slightly deep rooting depth and moderate plant available water, and are limited by the subsoil gravel. The soils are well drained, with good aeration in upper horizons that decreases with depth, and the subsoil is slowly permeable. Textures are silt loams, grading to sandy loams in the gravelly horizons. Topsoil clay content is about 20–30%, and slightly to moderately gravelly. Subsoils are typically very to extremely gravelly.

Fertility properties

Topsoil organic matter levels are about 13%; P-retention <30% in the topsoil, and 50–90% in the subsoil; and pH moderate (low–mid 5s). Cation exchange values are moderate and base saturation high. Available calcium, magnesium and potassium levels are moderate and soil reserve phosphorus levels low. Micronutrient levels are generally adequate.

Associated and similar soils

Some soils that commonly occur in association with Pebbly Hills soils are:

- Woodlands: formed in deep loess, with gravel at greater than 45cm depth, and imperfect drainage.
- Pukemutu: formed in deep loess, with gravel at greater than 90cm depth, and poorly drained due to fragipan
- Waikiwi: formed in deep loess, with gravel at greater than 45cm depth, and well drained.

Some soils that have similar properties to Pebbly Hills soils are:

- Oteramika: occurs across the Southland plain. Typically formed into a matrix of mixed quartz and highly weathered greywacke and schist gravel; moderately well to imperfectly drained
- Benio: occurs in northern Southland. Typically formed into a matrix of mixed quartz and highly weathered greywacke and schist gravel.
- Wairaki: occurs on high terraces and fans from the Takitimu Mountains. Formed in tuffaceous greywacke alluvium.

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	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–moderate clay and P-retention.
Nutrient leaching	severe	These soils have a severe vulnerability to leaching to groundwater. This rating reflects the good drainage and moderate water-holding capacity.
Topsoil erodibility by water	slight	Due to the high 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. The hilly phase will have nil vulnerability.

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.

PbH3 (Pebbly Hills hilly shallow)

Versatility evaluation for soil PbH3		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Unsuitable	Hilly slope
Arable	Unsuitable	Hilly slope
Intensive pasture	Limited	Hilly slope
Forestry	Limited	Restricted rooting depth

PbU3 (Pebbly Hills undulating shallow)

Versatility evaluation for soil PbU3		
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

PbR3 (Pebbly Hills rolling shallow)

Versatility evaluation for soil PbR3		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Limited	Restricted rooting depth
Arable	Limited	Rolling slopes
Intensive pasture	Moderate	Restricted rooting depth; vulnerability to leaching to groundwater
Forestry	Limited	Restricted rooting depth

Management practices that may improve soil versatility

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