

Mature sandstone soils

Omanaia | Puhoi | Omaiko Suites

Soil types in this group

- Awanui clay & sandy clay - AY, AYH*
- Awanui fine sandy loam & sandy clay - AYf, AYfH*
- Kapowairua clay & silty clay - KW, KWH*
- Mount Rex clay - MX, MXH*
- Puketurua sandy clay - PV, PVH*
- Riponui clay & sandy clay - RP, RPH*
- Riponui sandy clay loam & sandy loam - RPa, RPaH*
- Wairiki clay loam & silt loam - YR
- Warkworth clay & sandy clay loam - WA, WAH*

*The H denotes the hill variant of this soil type, which occurs on slopes over 20° and has a shallower profile.

This fact sheet uses NZ Soil Bureau map series soil type names and abbreviations.



0-15 cm
brown sandy
clay loam

15-50 cm
cream brown
clay

>50 cm
sandstone

Riponui clay and sandy clay (RP, RPH) profile

Features of mature sandstone soils

- Mature sandstone soils are found on a large proportion of the easy to rolling land in Northland
- They are part of the Omanaia, Puhoi and Waiotira suites
- Mature sandstone soils are strongly leached to weakly podzolised, so are lighter in colour because iron and aluminium have been leached out
- They are generally acidic, with low natural fertility
- Many of these soils are prone to gully erosion

Structure and drainage management

Issues	Management tips
Soils are all winter wet and prone to pugging Weathering and leaching of clay has reduced soil particle strength, making these mature soils more dispersive when wet and trampled by livestock	Careful winter grazing management can minimise pugging and compaction and protect soil structure
Drainage classes are generally imperfect to poor	Consider improving drainage infrastructure where practical, e.g. subsoil drainage
Topsoils can be shallow	Maintaining good pasture covers helps build soil organic matter and improve soil structure
Even proportions of clay, sand and silt in topsoils make them easier to cultivate, but continuous cropping is likely to result in loss of soil structure and compaction	Rotate land use between grazing and cropping to reduce soil compaction

Erosion control

Erosion risks	Soil type	Specific problems	Possible solutions
Gully erosion	All mature sandstones	Columnar subsoil structure increases risk of gully erosion Concentrated water flow can cause gullies to extend upslope and expand as the side walls collapse	Plant poplar or willow poles in a zig-zag pattern along the gully, with denser plantings at the head
	Puketurua sandy clay	Subsoils can contain sulphides which become extremely acidic when exposed to air, making revegetation very difficult	If sulphide levels are high and pH low in severely eroding areas, consider use of netting or debris dams to retain soil until growing conditions are suitable; otherwise allow time for sulphides to leach and apply lime to raise pH before planting poplars or willows
Landslide erosion (slips)	Omanaia suite	Omanaia suite soils are very unstable Mass movement is made worse by gully, streambank erosion and earthworks removing support from adjacent slopes	On actively eroding areas, densely plant at 5m spacings at the foot of slips, expanding to 8-10m spacings upslope Open plant poplars across hillsides at 15m spacing as a preventative measure



Typical mature sandstone soil landscape in Awanui

Nutrient management

Soil type	Nutrient status	Management strategies
All mature sandstone soils	<p>Mature sandstone soils are generally acidic, with low natural fertility</p> <p>In general, applied phosphate is readily available to plants</p> <p>Mature sandstone soils are relatively low in organic matter</p>	<p>Lime is required to reach optimal pH</p> <p>Less phosphate is needed to offset nutrient fixation by clays</p> <p>Maintaining good pasture covers helps build soil organic matter and improve soil structure</p>
Waiotira suite	Lower in sulphur than other mature sandstone soils	Test soils regularly

Drainage classes

Soil symbol	Full name	Drainage class
PUHOI SUITE Basement rock: banded sandstone		
WA, WAH	Warkworth clay + sandy clay loam	3 \Rightarrow 2 - Moderately to imperfectly drained
AY, AYH	Awanui clay + sandy clay	2 - Imperfectly drained
AYf, AYfH	Awanui fine sandy loam + sandy clay	2 - Imperfectly drained
MX, MXH	Mount Rex clay	1 - Poorly drained
OMANAIA SUITE Basement rock: sandstone–mudstone complex		
KW, KWH	Kapowairua clay + silty clay	2 - Imperfectly drained
YR	Wairiki clay loam + silt loam	2 - Imperfectly drained
WAIOTIRA SUITE Basement rock: massive sandstone		
RP, RPH	Riponui clay + sandy clay	2 - Imperfectly drained
RPa, RPaH	Riponui sandy clay loam + sandy loam	2 \Rightarrow 1 - Imperfectly to poorly drained
PV, PVH	Puketurua sandy clay	2 \Rightarrow 1 - Imperfectly to poorly drained

Northland soil factsheet series

- Northland's climate, topography, historic vegetation and mixed geology have combined to form a complex pattern of soils across the region. There are over 320 soil types in Northland. Other regions in New Zealand average only 20 soil types per region.
- The information in this fact sheet is based on a 1:50,000 mapping scale. Therefore, it is not specific to individual farms or properties. However, it may help you to understand general features and management options for recent alluvial soils.
- Knowing your soils' capabilities and limitations is the key to sustainable production in Northland. Northland Regional Council (NRC) land management advisors are available to work with landowners to provide free soil conservation advice, plans and maps specific to your property.
- Regular soil tests are recommended. If you are concerned about your soil structure or health, the Visual Soil Assessment test could be useful. Contact the land management advisors at Northland Regional Council for more information.
- Further background information about the processes that have formed these soils can be found here: www.nrc.govt.nz/soilfactsheets

Contact a land management advisor on
0800 002 004 or visit www.nrc.govt.nz/land