

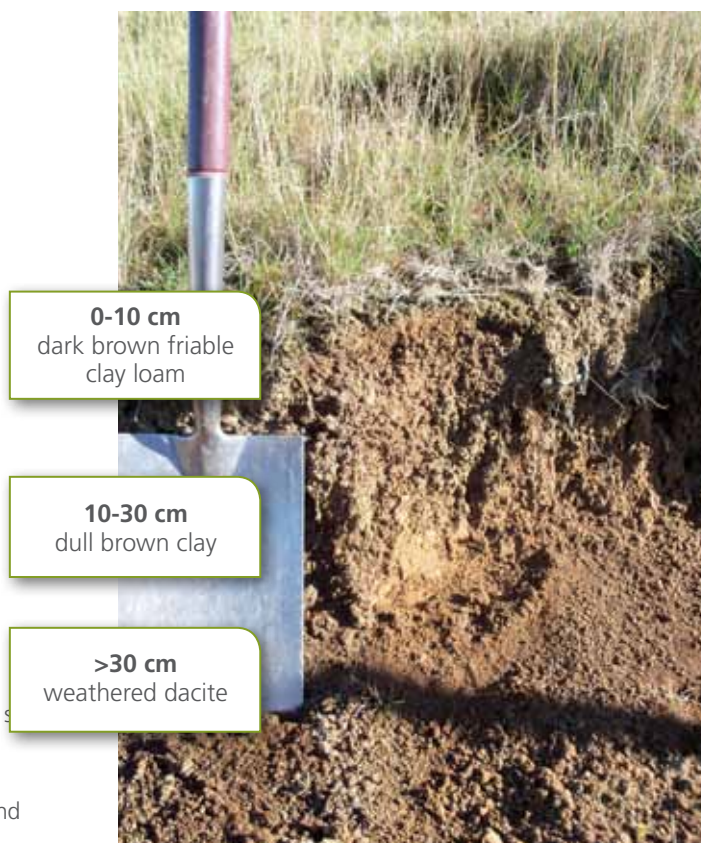
Young volcanic soils

Soil types in this group

- Kumurau sandy loam – KUH*
- Maungarei clay – ME, MEH*
- Maungarei clay with large boulders – MebH*
- Parakiore stony clay loam steepeland soil – PES

*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.



Parakiore stony clay loam (PES) steepeland soil profile

Features of young volcanic soils

- These soils formed from dacite, rhyolite and granodiorite – all acidic and silica-rich volcanic rocks
- They are part of the Maungarei soil suite
- Drainage classes vary widely, depending on local conditions and microclimate
- Friable topsoils are weakly to strongly leached, with high proportions of silica and little or no iron
- This group of soils is less naturally fertile than some other volcanic soils
- They dry out severely in summer
- Steep land is generally unsuitable for pasture, having shallow topsoils and surface rocks. It is very prone to slip, sheet and gully erosion

Structure and drainage management

Issues	Management tips
Shallow, friable topsoils (especially PES), dry out in summer, severely limiting pasture production	Manage grazing to maintain dense pasture covers to help prevent shallow slipping and reduce topsoil drying
Exposed subsoils are difficult to revegetate	
Overstocking and pugging cause sealing of the soil surface and increased surface runoff	Maintaining a dense pasture cover helps to increase organic matter in the soil
Young volcanic soils are friable. They often have an accumulation of clay over rock that impedes drainage and creates a slip plane	Carry lighter classes of animals to prevent pugging and surface sealing
Impeded drainage under what appears to be good volcanic topsoil often makes these soils unsuitable for horticulture	Consider retiring very steep or marginal pastoral land from grazing if pastoral returns are poor and/or weed invasion is a problem

Erosion control

Erosion risks	Soil type	Specific problems	Possible solutions
Slip erosion	All young volcanic soils on steeper slopes, especially Parakiore stony clay loam steepland soil	<p>Steep slopes are very prone to surface slipping, especially under pasture</p> <p>Shallow slips quickly revert to gorse because they are difficult to re-grass</p> <p>The topsoil can look stable but it sits on top of clay subsoil with impeded drainage</p> <p>In some places, a thick 2m soil profile puts more weight on the slip plane, increasing the risk of slips</p> <p>Revegetating bare areas is difficult because of the dry, infertile topsoils</p>	<p>Plant poplars to stabilise slip-prone land</p> <p>Consider retiring very steep or marginal pastoral land from grazing</p> <p>Site roads and tracks carefully to avoid undercutting slopes</p>
Gully erosion	All young volcanic soils, especially Maungarei clay soils	Gully erosion will worsen if left unmanaged	<p>Plant poplar or willow poles in a zig-zag pattern along the gully with denser plantings at the head</p> <p>Seek advice on how to armour drains to prevent erosion</p>
Sheet erosion	All young volcanic soils, especially after drought	During heavy rain, the friable topsoil is lifted in sheets and is lost downhill with nutrients and grass	Maintain dense vegetation covers



Maungarei clay soil (ME) in foreground and Parakiore stony clay loam steepeland soil (PES) on volcanic cone

Nutrient management

Soil type	Nutrient status	Management strategies
All young volcanic soils	Naturally less fertile than some other volcanic soils These soils lack aluminium and iron, and do not strongly fix phosphate	Little and often applications of fertiliser are recommended on these soils because whatever is applied will not be fixed so will be readily available to plants
All young volcanic soils	Acidic soils inhibit plant growth	High rates of lime may be required, but ensure application rates are based on soil test results. Seek advice from your fertiliser consultant and vet for nutrient requirements
All young volcanic soils	Organic matter levels are generally low	Avoid pugging and maintain good pasture or vegetation cover to promote a build-up of organic matter over time

Drainage classes

Soil symbol	Full name	Drainage class
MAUNGAREI SUITE Basement rock: volcanic dacite, rhyolite and/or granodiorite		
PES	Parakiore stony clay loam steepland soil	4⇒3 - Well to moderately well drained
KUH	Kumurau sandy loam	4⇒3⇒2 - Moderately to imperfectly drained
ME, MEH	Maungarei clay	4⇒3⇒2 - Well to imperfectly drained
MEbH	Maungarei clay with large boulders	4⇒3⇒2 - Moderately to imperfectly 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