

Mature semi-volcanic soils

Soil types in this group

- Dome Valley clay –DV, DVH*
- Mangonui clay – MN, MNH*
- Onetai complex – C8
- Parataiko silt loam – PTH*
- Parau clay loam – PA, PAH*
- Tutamoe friable clay – TO
- Waimamaku bouldery complex – C9, C9H*
- Waimatenui clay – YN, YNH*
- Waipoua clay – YP, YPH*
- Waitakere clay – YT, YTH*
- Whatoro clay – WT, WTH*

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

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



Waimatenui clay (YN, YNH) soil profile

Features of mature semi-volcanic soils

- These 'mature' semi-volcanic soils are a diverse group formed on lava, breccia, scoria and ash
- They are part of the Huia, Katui and Te Kie suites
- These soils include the C8, C9/C9H complexes that are clusters of various unnamed soils, making them vary widely and difficult to manage
- Mature semi-volcanic soils have friable free draining topsoil that dries out in summer months. However the sticky clay subsoil impedes penetration of water, causing the soil to be winter wet and prone to pugging
- The subsoil often has elevated levels of iron and aluminium, which can be toxic to plants. Therefore it is important to maintain the topsoil as it is difficult to revegetate pasture or other species in this subsoil
- Plant root depth can be restricted due to these subsoil conditions, making them more prone to the effects of drought
- Some of the largest slips in Northland have occurred on these soils
- Subsoil clays are very fine and very dispersive in water. Even small quantities stay suspended in water and travel a long way causing serious discolouration of streams

Structure and drainage management

Issues	Management tips
The dense clay subsoil reduces drainage. Soils are susceptible to pugging, compaction and then sealing of the soil surface when it dries	Manage winter pasture carefully to avoid pugging
Shallow, very friable (crumbly) topsoils are drought prone	Avoid overgrazing of pasture and maintain a dense pasture cover to help build soil organic matter, improve soil structure and retain moisture in the soil
C8 and C9/C9H soils are boulder-strewn and scattered with wet seeps, making access and growing trees and pasture difficult	Consider retiring marginal, bouldery areas of C8 and C9/C9H if returns are poor
Friable topsoils sit overtop heavy, low-pH clay rich in iron/aluminium that can be at toxic levels, discouraging root penetration	Raising pH will reduce toxic effects of iron/aluminium, allowing plant roots to better penetrate into subsoil
Sticky clay subsoils have high levels of colloidal clay, which are difficult to revegetate when exposed	Consider alternative land uses on steep land soils to reduce erosion and hold colloidal clay in place

Slipping on Waimatenui hill soil (YNH)



Erosion control

Erosion risks	Soil type	Specific problems	Possible solutions
Sheet erosion	All mature semi-volcanic soils	Where fertility is low and pasture covers are poor, exposed topsoil is prone to sheet erosion	Encourage dense pasture cover to prevent sheet erosion
Slipping	Mature semi-volcanic soils on steep slopes, especially bouldery complexes	Deep seated slumps and earthflows are often triggered by nearby streambank or gully erosion and undercutting by earthworks; note that areas of deeper soils can support pine forestry, but remain slip-prone	Poplars planted where rubble has accumulated at the base of slopes can prevent further erosion Road cuttings and banks should be revegetated as soon as possible after construction
Gully erosion	All mature semi-volcanic soils	Rubbly areas are susceptible to deep undercutting of gullies	Plant willows in a zig-zag pattern along gullies for stabilisation Avoid constructing drains or tracks in areas which are prone to deep-seated movement and gullyng
Streambank erosion	All mature semi-volcanic soils, particularly C8/C9 soils	Collapsing stream banks release large amounts of colloidal clay to water	Fence streams to prevent stock access and get advice on planting options

Nutrient management

Soil type	Nutrient status	Management strategies
All mature semi-volcanic soils	Iron and aluminium in the topsoil causes these soils to hold phosphate, making it less available to plants	Little and often applications of phosphorus are recommended to provide a more readily available and regular source of P to plants
All mature semi-volcanic soils	Soils are beginning to show micronutrient deficiencies due to high aluminium/iron coupled with leaching	Seek advice from your fertiliser consultant and vet for micronutrient requirements
All mature semi-volcanic soils	These soils are naturally acidic	Monitor pH levels and apply lime as needed

Drainage classes

Soil symbol	Full name	Drainage class
HUIA SUITE Basement rock: Tangihua volcanics Rubbly material erupted from Whangaroa, Whangarei Heads, Dome Valley, Waitakeres		
PTH	Parataiko silt loam	4⇒3 - Well to moderately drained
DV, DVH	Dome Valley clay	4⇒3 - Well to moderately drained
YT, YTH	Waitakere clay	4⇒3 - Well to moderately drained
PA, PAH	Parau clay loam	4⇒2 - Well to imperfectly drained
KATUI SUITE Basement rock: Tangihua volcanics Andesite lava flows on inland slopes of volcanoes that once extended seaward from Mangonui Bluff onto the Waipoua–Tutamoe Plateaus		
YP, YPH	Waipoua clay	4⇒3 - Well to moderately drained
WT, WTH	Whatoro clay	4⇒3 - Well to moderately drained
TO	Tutamoe friable clay	3⇒1 - Moderately to poorly drained
TE KIE SUITE Basement rock: Tangihua volcanics		
YN, YNH	Waimatenui clay	4⇒3 - Well to moderately drained
MN, MNH	Mangonui clay	4⇒3 - Well to moderately drained
C9, C9H	Waimamaku bouldery complex	4⇒1 - Well to poorly drained
C8	Onetai complex	2 - 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