

# Mature mudstone soils

## Soil types in this group

- Mata clay – MA
- Mata brown clay - MAr
- Okaka clay and silty clay - OA, OAH\*
- Puwera clay – PX, PXH\*

\*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.

## Features of mature mudstone soils

- These soils formed from different basement rocks: fine-textured silt and clay combinations known as mudstone and sandy mudstone, plus shale
- They are part of the Omu soil suite
- Different basement rock affects their fertility and stability
- Mature mudstones are lighter in colour than sandstone soils because they have less iron
- Mature mudstone soils are strongly leached to weakly podzolised



**0-10 cm**  
grey brown flecked clay

**10-50 cm**  
grey and brown compact clay

*Typical Okaka clay and silty clay (OA, OAH) landscape*

*Mata clay (MAr) soil profile*



## Structure and drainage management

| Issues   | Management tips   |
|--|---|
| Mature mudstone soils are easily pugged when wet   | Avoid overstocking and heavy stock to prevent pugging and soil structure damage<br>Grazing rotations and off-paddock wintering systems can also conserve soil structure |
| Drainage is generally quite poor, so sediment and nutrient runoff are common   | Improve drainage infrastructure where practical   |
| Less clay within the topsoil makes these soils easier to cultivate   | Use cropping good practice to preserve soils structure: rip and cultivate on the contour  |
| Cultivation for fodder crops, particularly maize and turnips, destabilises mature mudstone soils if care is not taken<br>Faulted and crushed underlying shale increases soil instability | Use no-till methods to establish pasture following summer crops to reduce the time the land is not protected by vegetation  |
| Weathering and leaching have reduced soil particle strength, making these mature soils more dispersive when wet and trampled by livestock  | 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 mudstones  | Column-like subsoil structure increases risk of unstable gullies<br>Gully erosion removes support from unstable, adjoining slopes. Once support is gone, slump and earthflow erosion can be triggered | Natural soil fertility is high enough to support most conservation tree species<br>Plant willows either side of the gully in a zig-zag to increase stability   |
| Slumping and folding | All mature mudstones, particularly in the Otaika and Puwera valleys south of Whangarei and in Okaka soils alongside Horeke Road in the South Hokianga | Faulted and crushed shale rock underlies some mature mudstones, increasing risk due to cracked foundation<br>The underlying shale rock, rather than the soil type, causes slumping                    | Plant poplars or willows across lower slopes of hillsides<br>Restore or create wetlands in valleys to trap sediment<br>Netting dams or grade control structures may be required to hold steep gullies before erosion control willows are planted, especially where subsoils are acidic |

## Nutrient management

| Soil type                 | Nutrient status  | Management strategies   |
|---------------------------|--|---|
| All mature mudstone soils | Mature mudstone soils are acidic, with low supplies of trace elements (copper, iron, etc) and macronutrients (nitrogen, phosphorous, potassium, etc)                                     | Lime is required to reach optimal pH  |
| All mature mudstone soils | Less clay within the topsoil means nutrients are not bound and are therefore more available to plants  | Less phosphate is needed to offset nutrient fixation by clays                                 |
| All mature mudstone soils | Mature mudstone soils are relatively fertile, suited to both pastoral farming and forestry; however, they are low in organic matter and cannot absorb large quantities of dairy effluent | Maintaining good vegetation covers helps build soil organic matter and improve soil structure |

## Drainage classes

| Soil symbol   | Full name                 | Drainage class                      |
|---|---------------------------|-------------------------------------|
| <b>OMU SUITE</b> Basement rocks: mudstone sandy mudstone and white siliceous mudstone |                           |                                     |
| MAR   | Mata brown clay           | 2⇒1 - Imperfectly to poorly drained |
| MA  | Mata clay                 | 2⇒1 - Imperfectly to poorly drained |
| OA, OAH   | Okaka clay and silty clay | 2⇒1 - Imperfectly to poorly drained |
| PX, PXH   | Puvera clay               | 2⇒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 estuarine 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 staff 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](http://www.nrc.govt.nz/soilfactsheets)

Contact a land management advisor on  
0800 002 004 or visit [www.nrc.govt.nz/land](http://www.nrc.govt.nz/land)