

Young basalt volcanic soils

Soil types in this group

- Kiripaka bouldery silt loam – KB, KBH*
- Kiripaka bouldery silt loam with compact subsoil –KBe
- Kiripaka bouldery silt loam with compact subsoil and large boulders – KBeb
- Kiripaka bouldery silt loam with large boulders – KBb
- Ōhaeawai shallow bouldery silt loam – OWb
- Ōhaeawai silt loam – OW
- Whakapai clay loam - WP
- Whakapai friable clay - WPe
- Whatitiri clay loam – WG

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.



Kiripaka bouldery silt loam (KB) soil profile

Features of young basalt volcanic soils

- These soils formed on basalt lava flows that are generally low in silica and rich in iron and aluminium
- They are part of the Kiripaka soil suite
- Topsoils are dark brown to dark grey-brown, subsoils are red to brown; both are very friable and break down to a very fine (powdery) granular structure
- They are otherwise known as brown loams and are classic volcanic soils suitable for both orchards and cropping and are some of Northland's most versatile soils
- All young basalt volcanic soils are generally free draining, requiring few drainage structure improvements
- These soils display only moderate weathering, and are weakly to moderately leached
- They have varying amounts of boulders, especially on the edges of ancient lava flows where molten rock cooled quickly
- Historic dry-stone walls can be a good indication of the presence of these soils

Structure and drainage management

| Issues | Management tips |
|--|---|
| These soils are friable and granular (nutty) on top (horizon A) with an accumulation of clay at depth. They have a clay texture, but have only low plasticity, making them 'brittle' and easily destroyed by over-cultivation or compaction when dry | To avoid compaction, soils should be allowed to dry after rain for a few days before running heavy equipment over them |
| Cultivation pans and surface compaction are common problems | Shallow ripping shatters cultivation pans/surface compaction and aerates soils, maintaining structure and reducing fungal root diseases |
| Topsoils can become a fine powdery surface layer known as a 'dust mulch' that seals the surface, repelling water and increasing runoff | Careful crop-pasture-crop rotations retain topsoil structure |
| Because they are generally free draining, they are drought prone | Maintaining good crop or pasture covers helps build soil organic matter and improve drought resilience |

Erosion control

| Erosion risks | Soil type | Specific problems | Possible solutions |
|---------------|---------------------------------|--|---|
| Sheet erosion | All young basalt volcanic soils | Friable or granular topsoil can be washed away in sheets, losing organic matter and damaging crops Runoff from higher ground increases the problem, as does the formation of water-repellent 'dust mulch' surface sealing from compaction or over-cultivation | Manage water discharge and flow from higher elevations Plant and cultivate on the contour |
| Rill erosion | All young basalt volcanic soils | Water runoff from compacted land above runs downslope, gouging channels or rills into topsoils Rills become deeper with successive rainstorms Bare, cropped soils are especially susceptible to rill erosion | For longer slopes use shallow grassed water diversion channels at intervals down the slope Using sediment traps in frequently or continuously cropped areas is recommended |



Kiripaka bouldery silt loam (KB, KBH) at Three Mile Bush

Nutrient management

| Soil type | Nutrient status | Management strategies |
|---------------------------------|---|--|
| All young basalt volcanic soils | Because these soils are well drained and warm up early in spring, organic matter can be quickly lost | Cropping and grazing rotations should be aimed at building organic matter |
| All young basalt volcanic soils | Soils are naturally fertile except for potassium, which is low in parent rock and is leached quickly through free-draining profiles Applied nitrogen also leaches out of soils rapidly; leaching is less of a problem where soils are deeper and/or with clay in the subsoil, or where there is a sheet of basalt rock below | Effluent and/or fertiliser should be applied little and often in order to reduce risk of leaching losses |

Drainage classes

| Soil symbol | Full name | Drainage class |
|---|---|----------------------------------|
| KIRIPAKA SUITE Basement rock: volcanic basalt lava flows | | |
| KB,KBH | Kiripaka bouldery silt loam | 4 - Well drained |
| KBb | Kiripaka bouldery silt loam with large boulders | 4 - Well drained |
| OW | Ōhaeawai silt loam | 4 - Well drained |
| OWb | Ōhaeawai shallow bouldery silt loam | 4 - Well drained |
| WG | Whatitiri clay loam | 4 - Well drained |
| WP | Whakapai clay loam | 4 - Well drained |
| WPe | Whakapai friable clay | 4⇒3 - Well to moderately drained |
| KBe | Kiripaka bouldery silt loam with compact subsoil | 3 - Moderately drained |
| KBeb | Kiripaka bouldery silt loam, with compact subsoil, and large boulders | 3 - Moderately 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