

LAND USE SUSTAINABILITY MONITORING

Highlights 2001-2002

- Soils were assessed for their quality by comparing the current chemical and physical condition of the soils against target values for that soil order and land use, and by identifying outlier values.
- The majority of soils were of suitable quality for the various land uses.
- A small number soil properties were outside the recommended limits for that soil and land use. In most cases, the property could be remedied by suitable soil management.
- Arable cropping presents the greatest risk to loss of organic resources through loss of soil structural stability.
- There was one instance of low macroporosity (resulting from compaction) under dairy farming.

Annual Plan Performance Targets

To continue to develop and implement a prioritised State of the Environment monitoring programme based on the Regional Policy Statement and Regional Plans, by:

- **Contributing funding to and participating in national environmental performance indicator development/trial projects for soils.**

Soil Quality – 500 Soils Project

As part of Northland Regional Councils State of the Environment monitoring programme 25 sites were sampled throughout Northland for their soil quality characteristics.

As a result of the review of land use sustainability monitoring conducted by the Northland Regional Council in 1999, it was identified that site-specific information about soil health was a key information need for the Council.

Indicators of soil quality are required to assess human and natural impacts on soils and to identify sustainable land management practices. For a soil to be rated a good quality, the soil condition must be well matched to its land use. Recognising this, soil conditions suitable for one use (e.g. low intensity grazing) may not be suitable for another land use (e.g. high intensity dairy farming).

Northland Region: Results and Interpretation

There were 6 land uses and 4 soil orders in the 25 sites sampled in Northland. Only the allophanic (Red Hill and Kiripaka soils) order had all 6 land uses. Arable cropping and horticulture land uses were only sampled on allophanic soils (Figure 7.1).

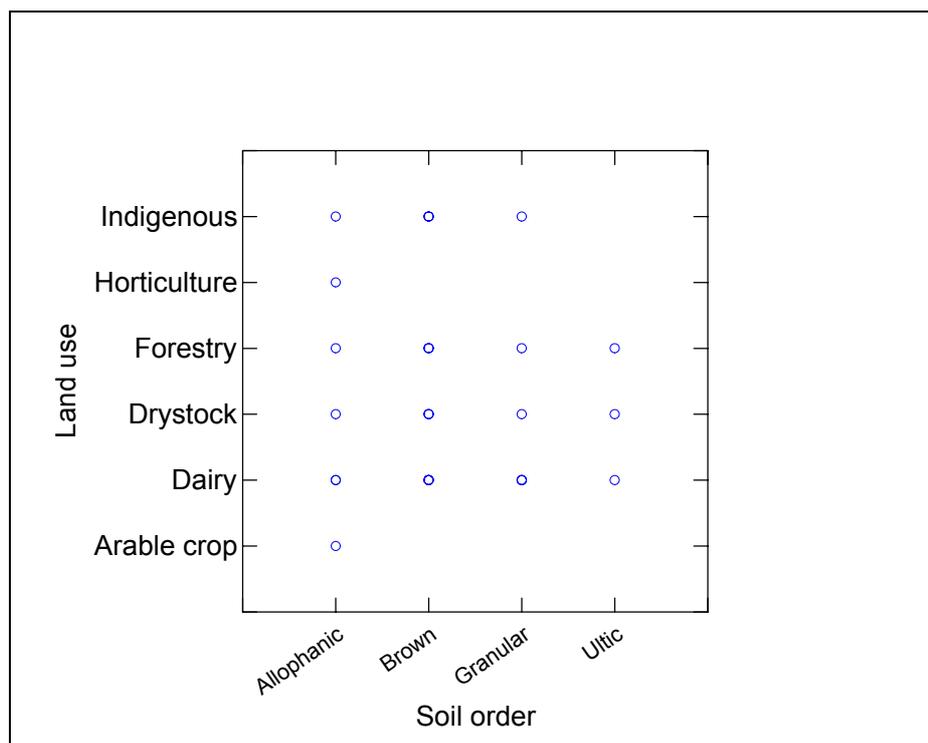


Figure 7.1: Soil orders and land uses sampled in the Northland region 2000–2001

The 25 sites were assessed for their soil quality by comparing the current chemical and physical condition of the soils against target values for that soil order and land use, and by identifying outlier values.

Results show that:

- The soil quality for the majority of sites was suitable for that soil type and land use. The greatest risk to soil quality occurred on a sandy loam used for cropping where there was a marked loss of organic matter and soil structural decline. This is a commonly observed trend on other soil types and results from increased mineralisation due to tillage, and decreased organic returns to the soil. Suitable management can reverse this loss of soil quality, and the risk is an on-farm one, rather than an environmental one. However, consequences of the loss of organic matter and structural stability are the need to apply greater amounts of fertiliser and the increased risk of soil movement during high intensity rainfall. Should these occur then this soil quality issue will be of concern to the Regional Council because of potential effects to the wider environment. At present it is difficult to quantify this risk, but it will inevitably increase if the area of high intensity cropping use also increases.
- A separate trend noted in Northland and other regions is the degree of soil compaction under dairy farming. The incidence in Northland (one dairy farm of the 9 sampled) was much less than in other regions, and at present the trend is not of concern. In general, soil compaction is an on-farm issue, as it can result in lowered production. However, if compaction under dairying became widespread, it could alter the drainage characteristics of catchments, and have potential effects on water levels and quality.
- In contrast to other regions, no excessively high fertiliser levels were recorded. Soil pH under those sites used for pine forests were similar to equivalent sites under indigenous forest, with no evidence of excessive acidification by plantation trees.

The health of productive soils is vital to the economic wellbeing of Northland. This project is a snapshot of Northland soils. A repeat of this survey in the future will detect changes, which will further indicate the effect different land use activities have on the life-supporting capacity of our soils.