

BORON LEVELS IN AUCKLAND AND NORTH
AUCKLAND FORESTS.

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Note: Confidential to Participants in the National Forest Fertiliser Co-operative program.

Introduction.

Boron levels in the Northern areas of New Zealand have until recently given no cause for concern. A sample from an area exhibiting boron deficiency symptoms was analyzed during the 1990 prescription sampling and confirmed to be deficient in this vital micro-nutrient. A search of the soil and site data-base listed all previous analyses for boron for the region and the lowest levels were found in forests in the same locality as the prescription sample. A total of 2300 boron analyses have been performed on Northern New Zealand pine forests.

This report presents the results of the data-base search.

Method.

All boron analyses from the foliage database for Auckland and North Auckland forests were printed out using the VAX datatrieve programme. An average for each forest was given. Most of the samples are from trial areas where fertiliser histories have been well documented enabling boron treated areas to be eliminated from the list where possible. The range given is the total range with the average containing plots where no history of boron application is available.

Distance from the coast was determined from maps, because sea spray is thought to be a significant source of boron.

Results.

All boron levels for Northland and Auckland have been summarised in the following table. Soil type does not appear to have affected boron availability with all types featuring in a range of boron levels, however distance from the coast does appear to have had an effect.

Table of Boron Levels in Northern N.Z. Forests.

Forest.	Soil type.	Distance from coast.*	Average boron level(ppm)	Range. (ppm)
Aupouri	Sand	1	14	7-16
Cape Karikari	Podsolized sand	1	20	15-33
Coroglen	Clay	2	30	24-35
Glenbervie	Clay	2	25	15-46
Kaikohe	Clay	3	16	13-21
Mahurangi	Sand	1	23	20-26
Mangakahia	Clay	4	12	10-13
Mangawhai	Sand	1	18	16-20
Maromaku	Clay	4	13	9-17
Maramarua	Clay	3	14	6-19
Matawai	Clay	4	9	6-11
Omahutu	Podsolized clay.	4	8	6-36
Opouteke	Clay	3	10	8-18
Otataroa	Podsolized clay	2	17	15-21
Parengarenga	Podsolized sand	1	20	18-23
Pipiwai	Clay	4	11	10-12
Poutu	Sand	1	16	14-18
Rakautao	Clay	4	15	14-16
Riverhead	Clay	2	13	9-23
Tairua	Volcanic clay.	1	20	12-23
Shenstones Farm	Podsolized sand	1	22	15-28
Te Kao	Podsolized sand	1	17	16-19
Waipoua	Podsolized sand.	3	23	16-29
Waiuku	Sand	1	11	9-14
Waitangi.	Volcanic bassalt.	1	25	12-29
Whangapoua	Clay	2	24	20-32
Whitecliffs	Podsolized sand.	3	13	7-19
Woodhill	Sand	1	16	9-30

* Distance 1 = 0 - 3km
 2 = 4 - 10km
 3 = 11- 20km
 4 = 21+ km

Conclusions.

More soils in New Zealand than previously documented have low boron availability although coastal forests gather sufficient boron from sea-spray. If drought occurs in Northland deficiency symptoms with resin bleed and damaged tree shoots will become more apparent. The climate in the area has masked the need for boron monitoring as trees are more likely to show symptoms of boron deficiency during an extended dry spell.

There does appear to be a risk of boron deficiency in North Auckland forests on podzols and intergrades to podzols where they occur more than 21 km from the coast. Generally the climate in Northland is moist with only short drought periods. However boron deficiency could occur in the central part of the peninsula in the event of a long dry period in summer.

The sample showing boron deficiency-like symptoms which began this investigation was collected after such a period.