

National Nectria Survey

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ABSTRACT

A national disease survey to determine if *Nectria fuckeliana* was present outside the known infected area was carried out in Canterbury, Westland, the Nelson region, and the central North Island. A total of 202 stands were inspected and fluting was recorded in 27 (13.4%). The incidence of fluting recorded in the national survey was markedly lower than that found in the known infected area. Increment bores were taken from fluted trees in 24 stands and sent to Forest Research for diagnosis. *Nectria fuckeliana* was not isolated from any sample. The result that *N. fuckeliana* was not isolated, and fluting was less common than in the known infected area provides confidence that the fungus is not present in the upper South Island or the central North Island.

BACKGROUND

A regional disease incidence survey has been completed throughout most of the Otago/Southland region. The aim of the survey was to determine the distribution, incidence and severity of Nectria disease and to identify any relationships between disease and other features such as host age, silviculture, topography, altitude, and aspect. A delimiting survey has been planned to determine the distribution of the disease in regions north of Dunedin up to the Rakaia River (about 80 km north of the known limit of the disease).

In addition to the surveys described above, a less intensive nationwide survey was planned. A selection of forests in Canterbury, Westland and Buller, the upper South Island, and central North Island was surveyed for the presence of fluting and other symptoms associated with Nectria disease. The results of the national survey are reported here.

OBJECTIVE

To determine if *Nectria fuckeliana* is present in regions outside the known infected area.

METHODS

The primary aim of the survey was to determine the presence of *N. fuckeliana*. Sampling was confined to trees showing typical symptoms of the disease, i.e. fluting. Stands were selected for assessment randomly, but pruned stands younger than 15 years old were targeted and the aim was to ensure a good geographical spread of sample points throughout a region. To keep cost to a minimum the survey was conducted in tandem with the NZFOA pest detection survey, whenever possible.

Regions surveyed

The national survey covered major forests in Canterbury, Buller, Nelson, and Marlborough in the South Island. In the North Island the survey was conducted in the central North Island.

Assessment technique

The survey was conducted primarily as a drive-through survey with stops. *Pinus radiata* stands aged between 4 and 19 years were assessed from the road if visibility into the stand was good. If visibility was not good it was necessary to walk into the stand a short distance. Details (location, estimated stand age and silvicultural treatment, presence of fruiting bodies, etc) were recorded and whenever typical symptoms were seen an estimate of disease incidence, i.e. trees with fluting estimated in 5% steps, was made.

Taking Samples

In the absence of fruiting bodies an increment core sample was taken from trees with definite fluting and sent for diagnosis. No more than five trees, but at least two, were sampled per stand, and no more than 20 samples were taken in a 20 km by 20 km zone. Cores were taken just above the fluted stub and were deep enough to obtain sapwood from deeper than the branch trace, i.e. about 10 cm.

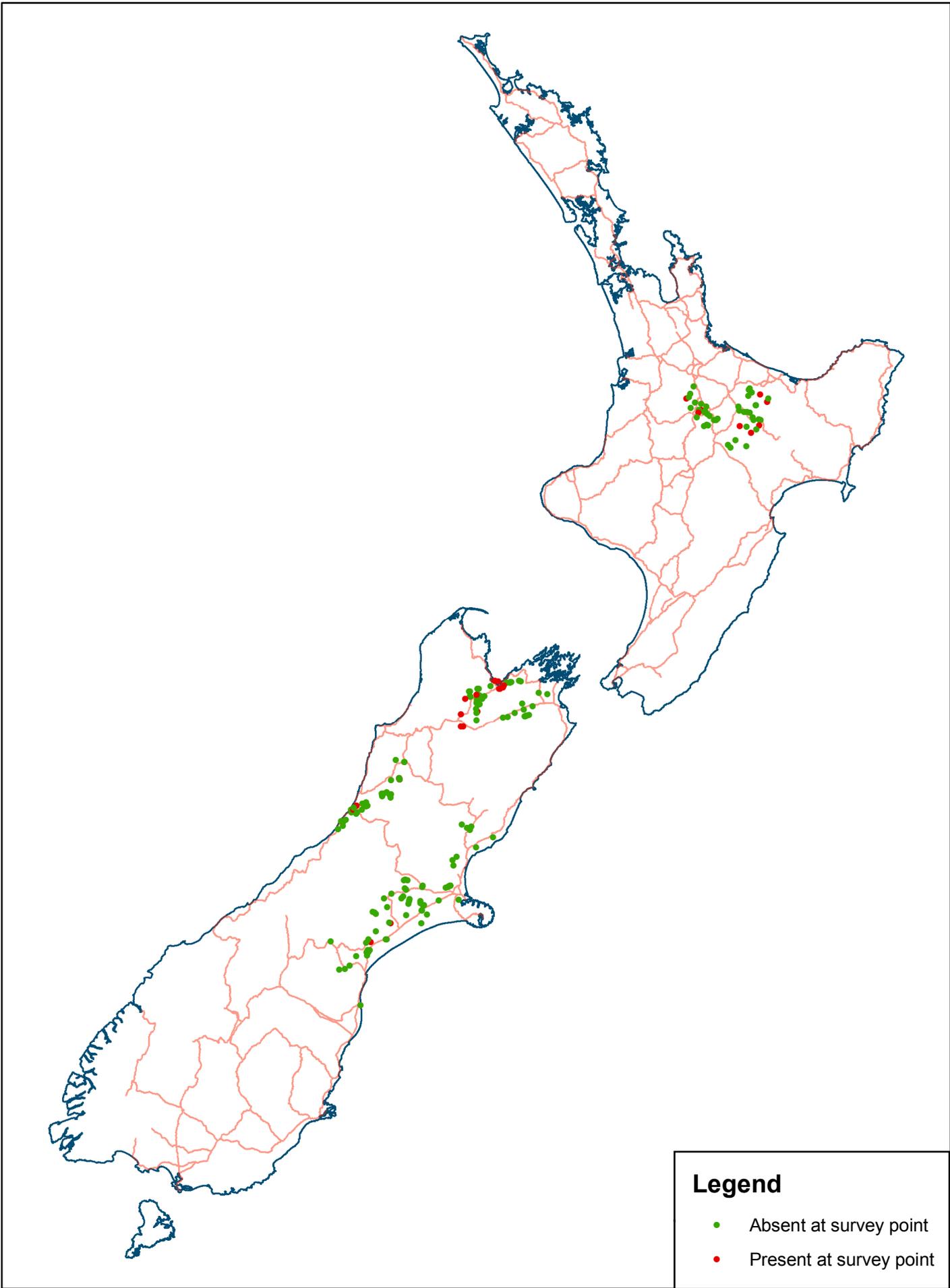
RESULTS

A total of 202 stands were surveyed (Table 1). Mid-Canterbury, Nelson, Taupo, and Buller were most intensively assessed (Fig. 1). The delimiting survey will cover South Canterbury more intensively and only 16 plots were assessed there in this survey. Much of the North Canterbury estate surveyed was unpruned and only 9 plots were assessed there. Seven (3.5%) stands assessed were unpruned, 68 (33.7%) were first lift pruned, 88 (43.6%) were pruned to second lift, and 39 (19.3%) had received a third lift. Just under 90% of the stands assessed were planted after 1989.

Table 1 – Number of stands assessed by region

Bioregion	No. of stands assessed
Waikato	6
Bay of Plenty	12
Taupo	31
Nelson	34
Marlborough	14
Marlborough Sounds	1
Buller	26
Westland	14
North Canterbury	9
mid-Canterbury	39
South Canterbury	16
Grand Total	202

The overall incidence of fluting was low (Table 2). Of the 202 stands surveyed 27 (13.4%) had fluting, despite stand selection being targeted to stands where fluting was likely – i.e. pruned stands not older than 15 years. Nelson had the highest percentage of stands where fluting was recorded (29%). Fluting was also found in the central North Island where fluting was recorded in 16% of the stands surveyed. Abundant fluting was not recorded except for one stand in the Taupo region where the percentage of fluted trees was estimated to be 25%.



**Survey Locations Showing
The Presence Or Absence Of Fluting**



Table 2 – Incidence of fluting by biological region and pruning lift

Bioregion		Pruning lift				Total
		0	1	2	3	
WO	No. stands assessed	-	1	1	4	6
	Fluting (%)	-	0.0%	0.0%	25.0%	16.7%
BP	No. stands assessed	-	1	10	1	12
	Fluting (%)	-	100.0%	10.0%	0.0%	16.7%
TO	No. stands assessed	1	4	15	11	31
	Fluting (%)	0.0%	25.0%	26.7%	0.0%	16.1%
NN	No. stands assessed	1	1	20	12	34
	Fluting (%)	100.0%	100.0%	20.0%	33.3%	29.4%
MB	No. stands assessed	-	4	8	2	14
	Fluting (%)	-	0.0%	0.0%	0.0%	0.0%
SD	No. stands assessed	-	1	-	-	1
	Fluting (%)	-	0.0%	-	-	0.0%
BR	No. stands assessed	-	3	15	8	26
	Fluting (%)	-	0.0%	20.0%	25.0%	19.2%
WD	No. stands assessed	-	1	12	1	14
	Fluting (%)	-	0.0%	0.0%	100.0%	7.1%
NC	No. stands assessed	5	1	3	-	9
	Fluting (%)	0.0%	0.0%	0.0%	-	0.0%
MC	No. stands assessed	-	35	4	-	39
	Fluting (%)	-	0.0%	25.0%	-	2.6%
SC	No. stands assessed	-	16	-	-	16
	Fluting (%)	-	6.3%	-	-	6.3%
Total	No. stands assessed	7	68	88	39	202
Total	Fluting (%)	14.3%	7.4%	14.8%	20.5%	13.4%

Identifications

Nectria fuckeliana was not isolated from any of the samples received. A total of 24 stands were sampled. *Sphaeropsis sapinea* was isolated from 10 stands; other fungi isolated included *Trichoderma*, *Pestalotiopsis*, *Aureobasidium*, and a white decay fungus.

DISCUSSION

Over 200 stands were surveyed for the presence of fluting. When fluting was seen samples were taken and sent for laboratory analysis. *Nectria fuckeliana* was not isolated. Previous work has shown that isolations from increment cores will provide an acceptable probability of detecting *Nectria fuckeliana* in a stand if it is present. *Sphaeropsis sapinea* was isolated from samples from 10 of the 24 stands sampled. This fungus can cause symptoms similar to those seen associated with *N. fuckeliana* and was a source of confusion when disease was first reported in the Southern region.

Fluting incidence was very much lower than that found in the known infected area. Fluting was recorded in just over 13% of the stands surveyed in this study. Provisional results from the regional incidence survey carried out in the Otago/Southland region indicated that over 20% of the 9,180 trees assessed had fluting. Some degree of fluting was recorded in over 90% of 221 randomly placed 20-tree plots.

The national survey was limited with regards to the number of stands assessed and the number of samples sent for identification. However, the findings that fluting incidence in the surveyed area was markedly lower than in Otago/Southland, and that *N. fuckeliana* was not isolated, provide confidence that the fungus is not present in the upper South Island or in the central North Island.

ACKNOWLEDGMENTS

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