

## A STAND OF BEECH REGENERATION OF KNOWN AGE.

(F. W. Foster.)

In Nelson Province beech forests are occasionally seriously damaged by severe gales, which raze to the ground all trees on areas of 1 to perhaps 50 acres of shallow-rooted beeches, whilst firmer rooted rimu in the vicinity escape.

In August, 1898, a heavy south-easterly gale brought down patches of beech forest near Reefton, and the purpose of this short paper is to present certain growth data relating to the natural regeneration which has resulted.

The area which was briefly investigated extended to 5 acres, and the stand as it was windblown nearly 33 years ago consisted, so far as can be ascertained from the uprooted trees, of 75 Red Beech (*Nothofagus fusca*) to the acre; mostly large trees up to 3 feet and more in D.B.H. These old trees were shallow-rooted and probably overmature and defective.

This was the only apparent species of saw-timber size, though there may have been some trees of Silver Beech (*N. Menziesii*), a living specimen of which, over 2ft in D.B.H., was seen near the temporary plot. Its bole, however, was only about 8 feet high, at which point, as is typical of this species in the locality, the tree branched heavily. Any Silver Beech that may have been damaged in the gale of 1898 would long since have entirely rotted away. At the present time the stand is comprised of two storeys, the top one, about 60 feet high, being of Red Beech and the under-storey, about 35 feet down to 15 feet, of Silver Beech.

Considering Red Beech first, recent measurements on a temporary plot revealed 660 trees per acre (4ins. D.B.H. and over) and also 150 large saplings 2 and 3 inches in D.B.H.

The run of diameters was as follows:—

D.B.H.	....	....	2:	3:	4:	5:	6:	7:	8:	9:	10:	11:	12:	13:	14
Number															
of stems	....	....	40:	115:	110:	175:	135:	85:	90:	30:	10:	10:	10:	—:	5

The mean D.B.H. of trees 4" and over was 6.5 inches.

The mean total height was 64 feet, 41 feet to a 4-inch top, and 30 feet to a 5-inch top.

The trees were of excellent form, clean of side branches, and approximately 5 per cent. only were forked low down.

Measurement of a mean tree gave a total volume in-

side bark of 6.645 cubic feet, or a mean annual increment for 33 years of 133 cubic feet per acre.

Rings were counted on several stumps that were available and varied from 30 to 32, indicating that rings are apparently annual, which is to be expected in the locality, where winters are fairly severe.

A stem-analysis was not made, but ring-counts from six high stumps (practically at breast-height) of trees that were all co-dominant were plotted for comparison—in so far as they can be compared—with Schlich's European Beech on Site I. Schlich's trees (quoted from Swappach's Yield-Tables) had a mean diameter at ages 10, 20, 30 and 40 years of 0.7ins., 1.7ins., 3.0ins., and 4.5ins. respectively. At Reefton the corresponding figures (for co-dominant trees) were 2.5ins., 4.6ins., 6.5ins., and (curve produced) 8.1ins.

At Reefton there were 660 trees per acre at 33 years, in Europe about 1500 trees, while the total heights were respectively 64 feet and 35 feet. The mean annual increment of the European beech forest at 30 years of age was 23 cubic feet per acre.

There were also tallied 80 *N. Menziesii* trees per acre, from 4 inches to 10 inches D.B.H., the mean 5 inches. These trees were low-branched, straggly and obviously out of their proper locality as timber-producing trees. They were only 35 feet in height, and many (not measured) were dead, few ever exceeding 3 inches D.B.H.

The soil was a yellowish loam on decomposed granite, the site almost level, and generally speaking well-sheltered. The locality is 700 feet above sea-level, and its quality is Site I. The underscrub was scanty and seedlings of *N. fusca* were common where there was sufficient light.

#### **Conclusion:**

It is my opinion that when the uses of beech have become better understood and extended, native beech forests will be found to be readily amendable to silviculture and management. The trees grow much faster than the podocarps and faster than kauri.

The stand under investigation, though quite untended, compares more than favourably with European stands. In fact, the growth would perhaps by European foresters be considered phenomenal. Thinning commenced about the 20th year should produce a valuable final crop of clean milling timber free from defect, perhaps in a rotation of 60 years (in Europe the rotation for beech is 120 to 140 years), while in mining districts (as in Reefton) thinnings are readily saleable as mine props.