

2. **Buds**—brown, matt, small, almost minute—rounded at apex ; covered with several series of overlapping scales. Buds spirally arranged.
3. **Bud-break**—last week of August. Transplanted to pot at first sign of bud-break ; pot plunged in nursery soil outside.
4. **Roots**—at transplanting were thin and straggling with no external sign of mycorrhiza. Three most distal root-tips, however, had marked thickenings for $\frac{1}{4}$ inch behind the tip, structure almost resembling the velamen of an orchid root externally. As only a single seedling was available, no closer examination was made.
5. **Full leaf**—Transplanting caused no obvious check and plant was in fully expanded leaf by the third week of September.
6. **Leader Growth**—good, straight and normal for a conifer. Three inches height growth by mid-November.

These notes are not intended as a particular record for height growth. The plant could undoubtedly have been protected and semi-forced to give better growth. It was purposely grown and left outside in full weather to determine its hardiness to the locality. The interesting matters that emerge are :

- (a) Its short leafless period of 3 months only.
- (b) Its process of abscissing twigs instead of leaves.
- (c) Its root peculiarity which merits investigation if and when more material is got.

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20th November, 1950.

SOME SOUTH AMERICAN SPECIES OF NOTHOFAGUS

In 1935 there was an exchange of seed samples between the New Zealand and Argentine Forest Services. The seeds received included the deciduous *Nothofagus obliqua* and *N. procera*, and the evergreen *N. dombeyi*, all of which were successfully sown in the spring of 1935. The resulting trees were distributed to various forests, arboreta and interested individuals as 1/1 stock in 1937. The writer established a few *N. obliqua* and *N. procera* and one *N. dombeyi* at Kiwitea near Feilding ; they grew vigorously but suffered some breakage and defoliation by opossums and boring by ghost moth (*Charagia virescens*).

In the summer of 1948-49 most indigenous species of *Nothofagus* flowered and seeded abundantly, at least in the southern half of the North Island. It was a "mast" year such as normally occurs only once in a decade. Several trees of 13-year-old *N. obliqua* and one

of *N. procera* also flowered freely and produced seed, all of which was empty and infertile; *N. dombeyi* did not flower. The following season (1949-50) was an "off" year for the indigenous species and the only South American tree to flower was a specimen of *N. obliqua* the top of which had broken out at a ghost moth injury a few years earlier; it had also suffered almost complete defoliation by opossums following flushing in August of that and the previous year, more leaves developing later when the intensity of browsing was reduced through other highly palatable fare becoming available. Though this flowering was not heavy and must have been reduced by the opossums, a light crop of seed resulted and a small porportion had fully developed kernels. The seed was stratified as soon as collected and sown in August, 1950; from it a few dozen seedlings have been obtained.

During the present (1950) spring the same specimen of *N. obliqua* was the only deciduous beech to produce flowers and these were few. However, at 16 years from seed the evergreen *N. dombeyi* has flowered, though only lightly. Both staminate and pistillate flowers appeared at the end of October, about 6 weeks later than those of *N. obliqua*. Anthers are a brighter red than those of *N. solandri* or *N. cliffortioides* and one can well believe that a forest of this tree in flower would merit the praise recently lavished upon it by a horticultural writer.

There are two points calling for comment in these flowering and seeding observations. Firstly, the fertile seed produced by *N. obliqua* was almost certainly self-pollinated; no other trees of the species were observed to flower; in any case they were at some distance down wind and partly screened by other trees. If the single specimen of *N. dombeyi* should produce fertile seed this season self-pollination will be proven. Secondly, it is possible that defoliation may have induced flowering: the *N. obliqua* which produced seed the season following a general flowering of the genus in which it also participated has been particularly heavily browsed in the last few years; the present flowering of *N. dombeyi* may also be connected with heavy browsing which took place mainly during the winter of 1949.

As several hundred trees of these three beeches were distributed in 1937 it would be interesting to learn how they have behaved elsewhere.

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FLOWERING OF AGATHIS AUSTRALIS

The older botanical authorities from Hooker onward state that *Agathis australis* is dioecious. Even modern authorities regard the *Araucariaceae* as a dioecious family and it is well known that *Araucaria* falls into this category.