RECENT SOUTHERN BEECH FLOWERING SEASONS

In the Spring of 1948 a general flowering of New Zealand southern beeches, though not always of *Nothofagus menziesii,* was recorded in most forests of these species throughout New Zealand. Wherever this flowering occurred it was usually followed by good seeding in the autumn of 1949. It was preceded by a summer that was hotter than the average; and examination of the few records available showed that known flowering years had also been preceded by hot seasons. Altogether, there appeared sufficient evidence to postulate that the flowering of southern beeches in New Zealand was affected by the average temperature—and possibly rainfall—of the preceding season, and that a hot summer was required to produce a good flowering in the spring following. The flowering behaviour of *N. menziesii* appeared to be anomalous, though no close observations were made in forests of this species.

The correlation postulated above is in keeping with observations on the flowering and seeding of the European and American beeches (*Fagus spp.*) European beech growing in this country did in fact flower prolifically in 1948 in the same manner as the four indigenous southern beeches.

In the years following 1948 the flowering and seeding of southern beeches has been more accurately observed, by a number of people, than at any previous time. Summarising these observations the following prolific flowerings have been recorded.

In the spring of 1951 the Westland, Reefton, and Buller forest offices reported good flowering of all species, and this was followed by heavy seed falls in the following autumn—the flowering of 1948 in these districts had been followed by a negligible seed fall. This flowering was also reported in the Nelson district and at Takaka, so that it possibly occurred throughout the extensive forests in the north west of the South Island. Of this flowering Bannister (D.S.I.R. Botany Division Report) reported, "The evidence indicates widespread flowering in this district (Nelson) of *Nothofagus fusca, N. truncata, N. solandri, and N. cliffortioides,* while in *N. menziesii* some individuals have flowered heavily, but most have not flowered at all. Almost every tree affected bore a profusion of flowers. There has been considerable variation in this, but it has nonetheless been a profuse flowering season. Some trees of *N. solandri* had their foliage almost hidden by flowers."

Records from the Nelson, Westport, and Hokitika meteorological stations show that this flowering was preceded by average monthly mean daily temperatures 0.5 to 3.5 degrees Fahrenheit above normal for the consecutive months October 1950 to April 1951.

The summer of 1952-53 was noted for its exceptional dryness on the West Coast and in West Otago, and the average monthly mean daily temperatures for October and February were above normal, usually by one or two degrees Fahrenheit at the Westport, Hokitika,

and Haast meteorological stations. This hot dry season was followed by a heavy flowering of beech in the spring of 1953. Concerning part of this flowering, Grayburn wrote (N.Z. Forest Service Report), "There is a prolific flowering in *N. cliffortioides* in P.S.F. No. 72 on the shores of Lake Hawea. There is also a good showing of the red flowering mistletoe."

The spring and summer months, 1953-54, were hotter than average in most parts of New Zealand, one of the exceptions being the west Otago region. In the following autumn fairly plentiful lammas flowering was seen in the beech forests around Wellington, and records of similar flowering were sent in from other parts of the country. As in the 1948 flowering year, this lammas flowering proved to be the forerunner of another good season, more particularly at lower altitudes. In general it appeared to be as heavy as that which occurred in 1948.

The flowering, whenever it occurred, seems to have been followed by good seeding, but this will not be commented on here. It has been measured in the beech forest west of Lake Wairarapa where annual measurements have been made since the 1949 seed year. These figures will be published later.

In the many records of the above flowerings *N. menziesii* was sometimes stated to have flowered along with the other species present. The most closely observed record, however, that of Bannister for the 1951 flowering in the Nelson district, referred to the flowering of individual trees of *N. menziesii* only. In the silver beech forest being placed under management, Rowallan Valley S.F. 53, Williams (N.Z. Forest Service Report) reported that seed years occurred in 1950, 1951, and 1953. Whether all trees seeded in these years, or only some trees seeded each year, is not known. These seed-years are not related to previous hot seasons. The anomalous behaviour of *N. menziesii,* and the frequent seed-years so far in this district, is particularly fortunate for this management scheme.

A. L. Poole.

A TOKEN SYSTEM OF PAYMENT FOR PIECEWORK THINNING

In Canterbury, forest management faces major problems consequent on insufficient supply of skilled forest labour and absence of any industry capable of absorbing large volumes of small diameter produce. These deficiencies result in high cost thinning to waste, with inevitable accumulation of silvicultural arrears. For Ashley Forest this is a matter for concern since the oldest *P. radiata* stands have reached the stage where maximum benefit would be obtained from treatment.

Incentive payments, under contract and piecework systems, have eased the labour problem elsewhere, particularly in pruning operations;