

sient to keep coarse herbage completely in check, it is reasonable to expect that, should the ratio of success attained from the past two seasons' breeding operations be repeated over the coming period of like duration, our flock will have assumed sufficient proportions to permit the total discontinuance of fire-break cultivation-work over certain plantations. Undoubtedly the excellent returns from the venture during the year were due to some extent to the abnormal season; but it has now been amply demonstrated that the judicious pasturing of our young forests in no way affects the progress of trees, as the animals keep almost entirely to the fire-barriers where pasture is sweeter, and excepting when sheltering are rarely found in the interior of the planted compartments. Since the initiation of the scheme some £201 16s. 8d. has been expended in the direct purchase of wethers and breeding-ewes, and for this outlay our season's credit on transactions amount to £493, inclusive of £99, being the season's proceeds from wool sold.

#### IMPROVEMENT OF FIRE-BARRIERS.

The importance of strengthening our weakest spots along the fire-barriers is not being lost sight of. Originally the value of providing each plantation with effective intersecting and marginal fire-lines appears to have been underestimated, and realizing this position it was deemed necessary to face an unexpected expenditure in widening and extending protective breaks at each plantation. At the present time a safety unit of from 250 to 300 acres is arrived at, each block being surrounded by unplanted spaces varying in width from 66 ft. to 132 ft. according to the contour of the country, aspect, and other conditions. In operating upon rough hills abounding in rocky outcrops it is extremely puzzling to solve the fire-break problem. Where horse-work is impracticable the expenditure necessary to annually remove tussock and other coarse vegetation from a 2-chain barrier amounts to almost a prohibitive figure, and in such cases a discreet lessening in width is the only alternative.

Unfortunately the year's operations were marred by the destruction through fire at Hanmer Springs of about 30 acres of plantation about fourteen years old, consisting principally of *Pinus australis*. The fire originated on an adjoining property, and it was only by the timely and sustained efforts of the fire-fighters that a very much larger loss was averted. The depots containing fire-fighting apparatus installed about a year before proved of immense value and justified the small expenditure devoted to their establishment. Negotiations are now proceeding for the recovery of compensation from the owners of the land on which the fire originated.

During the year an approximate £205 was expended in the cultivation (both horse and manual) of some 310 acres of fire-lines; but, as already alluded to, the utilization of sheep was the chief means of keeping this item within reasonable bounds.

#### TREES FOR FARMERS AND PUBLIC BODIES.

Notwithstanding the little publication given to the fact of the Department's decision to supply farmers with a limited number of trees for specified purposes at cost price, some eighty applications for over 300,000 trees were received. This number greatly exceeded anticipations, although it was possible eventually to comply with the requests of forty-three applicants, including public bodies, who were supplied with 226,889 trees, valued at £446 8s. 3d. From communications received it would appear that a very fair measure of success has attended the individual planting, although in rabbit-infested districts still greater attention requires to be devoted to the eradication of the pest before the best results accrue. Undoubtedly *Pinus radiata* is in greatest demand for shelter-planting in districts where the minimum temperature does not affect the species; but *Populus fastigiata* and *P. deltoides* have also been much sought after from Central Otago residents. For planting on higher altitudes both *Pinus Laricio* and *P. ponderosa* were used with success, and there is no doubt that both these varieties have become established favourites among tree-planters aiming at the production of useful timber for general requirements.

In addition to the experimental work now being undertaken by the Department in various places, several farmers kindly consented to test in their districts the suitability of the different species of the *Pinus* and *Eucalyptus* genera. Such experiments involved no departmental outlay, while providing those undertaking it with interesting data on arboriculture. Of the *Pinus* family perhaps *Pinus Banksiana*, *P. Murrayana*, and *P. Taeda* are so far showing to the best advantage; but *Pinus sylvestris* in every situation tried proves a veritable harbour for the insect pest (Chermes), and does not merit further trial beyond a test above the 2,000 ft. level. Success with the eucalypts has not been general, and of the five species tested—*Eucalyptus viminalis*, *E. Macarthuri*, *E. sieberiana*, *E. piperita*, *E. Muelleri*—the two former gums have clearly demonstrated their superiority in hardiness and adaptability to trial-conditions.

In compliance with a request from the Public Works Department for our co-operation in establishing plantations in the vicinity to the recently erected power-house at Lake Coleridge, a scheme was drawn up and carried out under the supervision of a representative of this branch. From the outset it was believed that the combination of wind violence and severe frosts encountered in the Rakaia Gorge would make the complete success of operating with various trees problematical, and, although expectations have been borne out to some extent, the outcome of the season's work is indeed gratifying, and has stimulated the desire of the Public Works officials for an immediate extension of the afforestation scheme. Present indications tend to show that of the varieties planted *Pinus Laricio* and *P. ponderosa* will thrive with ordinary attention, whilst *Pinus radiata* on becoming established retains its distinction of being the fastest-growing tree under almost any conditions. Many of the trees for the coming year's planting will be taken from the small successful nursery established on the estate, and this arrangement would dispense with the possibility of a repetition of last year's occurrence in an enforced delay in delivery and subsequent heating of many of the trees. Included in the next programme of work is the improvement to the immediate surroundings of the power-house and town-