NOTES

COMPARATIVE TRIAL OF LOW-PRUNING METHODS AT BERWICK FOREST, SOUTHLAND

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SYNOPSIS

Methods of selection for pruning were: (a) Marking of selected stems with paint before commencement of pruning, taking into account form and vigour. (b) Selecting of trees done by the pruning gang, with a compromise between form and vigour in their selection of one tree out of every three. (c) Selection by the pruning gang but purely on vigour of trees, and one tree out of two. (d) All satisfactory trees pruned.

Costs were calculated for each of the methods used, and the final effects of the selection methods on the stand assessed.

It was concluded that worker selection of one tree out of every two, with the accent purely on vigour, was not only the cheapest method but also the one most likely to achieve the requisite number of pruned stems per acre.

INTRODUCTION

The low-pruning prescription for *Pinus radiata* in the Berwick Working Plan is:

Mean top height	15 ft
Approximate age	6 to 9 yr
Pruning level	0 to 6 ft
No. of stems to be pruned per acre	300

Difficulty has been encountered in the past in marking *P. radiata* that was due for low pruning in such a way that a sufficient number of vigorous trees were pruned to provide ample selection for further pruning. It has been found that, where form was taken into account in selection for low pruning, the more vigorous but unpruned tree gained dominance over the selected pruned tree. Prompted by these difficulties and the pruning costs involved, four plots were chosen at Berwick Forest in 1963, and various methods of marking and selection were investigated. The stand picked for the investigation was planted in 1956 with *P. radiata* at 8 ft × 6 ft, with an original survival of 96%. However, over the years there had been a progressive and significant reduction in the stocking to about 600 to 750 stems per acre, the main cause being opossum damage. The plots were adjacent to one another within this stand and a sheltered northerly aspect prevailed throughout. The trial area totalled 21.4 acres and was considered both representative and typical for the area.

Branch size, owing to the fairly open nature of the stand, was generally large and some of the more vigorous trees had branch

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diameters at the stem of at least 2 to 3 in. Labour used was a mixture of experienced men and complete tyros (probably the usual situation in any forest); and pruning tools used were curved pruning saws and Porter pruners.

PLOT SCHEDULES

Plot I: This was marked for pruning by a leading hand and a woodsman, taking into account form and vigour of the tree to be marked and trying to achieve a stocking of approximately 300 to 350 pruned stems per acre.

Markers found that, if usual standards of selection were to be kept, this figure was virtually impossible to achieve; and workers found difficulty in locating marked trees. This latter difficulty could be solved by liberal application of marking paint to the foliage, but paint costs would go up accordingly.

Plot II: This was by far the best stocked plot and probably had what an 8 × 6 ft planting should carry at 6 to 7 years. Selection for pruning was done by the gang on a one-out-of-three basis. The pruner selected one tree out of three in the same row, and the next tree past the one selected for pruning was again considered in the next group of three. This method worked well and trees were selected on a compromise between vigour and form. Using this method it would, theoretically, be possible to prune every tree.

Plot III: This had taken a heavy set-back from opossum damage over the years and had the lowest stocking of the four plots. Selection was again done by the pruning gang, but on vigour only, with a one-out-of-two selection. The pruner took two trees in a row, pruned the more vigorous, and then moved on to the next two.

Plot IV: Instructions here were to prune everything except gross malformations, whips, and suppressed trees.

RESULTS

Plot details, with correlated man-hour production, are summarized in Table 1.

TABLE 1

	Plot I	Plot II	Plot III	Plot IV
Area (acres)	3.9	5.7	6.8	5.0
Stocking per acre	670	753	504	596
Stems pruned per acre	202	277	253	467
Stems pruned per man-hour	7.3	12.4	12.7	10.1
Costs per acre	£10 9s	£8 17s	£7 10s	£17 15s

Costs shown in the table include neither the marking in Plot I nor tallying of the pruned trees in all plots. With the exception of the marked area (Plot I), the man-hour rates are fairly constant; they include the leading hand's time, although at least half of his 8-hour day would be supervision only, the remainder being spent pruning. Plots II and III necessitated some long walks from the vehicle, but Plots I and IV were adjacent to the road.

The only method of selection which gave superfluous numbers of pruned trees per acre was Plot IV —— virtually 100% pruning; but only in exceptional circumstances would costs of the order of £17 10s per acre be justifiable. The selection and marking in Plot I proved costly and did not result in selecting the desirable number of pruned stems. Thus the choice lies between the methods used in Plots II and III.

The method of selection in Plot II took into account vigour and form. This led to a certain hesitancy on the part of the pruner, for if the better formed but slightly less vigorous tree is picked for pruning, there is always the chance that it will be overtopped by a more vigorous neighbour. Thus the selection of one tree out of two on vigour alone would appear the cheapest and most efficient method of the four investigated.

CONCLUSIONS

Pre-operational marking by trained personnel for low pruning *P. radiata* is unnecessary. Worker selection of one out of two trees, with accent purely on vigour, is the system most likely to produce an acceptable number of low-pruned trees per acre.