ONE WAY TO SELECT 100 FINAL CROP TREES PER ACRE.

by A. Kesners

Marking for high pruning is usually done to a density of 100 trees per acre, and various methods are used to achieve this.

The most common one used in our Radiata plantations is based on a simple proportion of total number of trees per acre to the number of trees to be marked. Thus if the area contains 800 trees to the acre and 100 of these have to be selected, one tree in eight is marked. Provided the spacing between trees is constant and accurate, this method also will be accurate, assuming of course that an allowance for extraction and cross tracks is made.

In our northern pinaster plantations the initial spacing in some of the older plantings, however, is rather inconsistent and erratic, and the above method therefore could not be used satisfactorily. Different markers developed their own systems, but all these systems, with variations, had one feature in common - they were based on subdividing an area into various size grids, either by pacing only or by pacing and demarcation.

For example, in an area with rows 6 ft. apart, and four rows being selected from at a time, the following calculation was made:

        43,560 sq. ft. = 1 acre
        435.6 sq. ft to 1 tree
        4 rows at 6 ft apart = 24 ft.
        436 divided by 24 = 18 1/8ft.
        66 ft = 22 paces (by the writer)
        18 1/8ft = approx. 6 paces.

Thus the area is divided into 24 ft x 18 ft grids, and in every six paces taken by the marker, one tree is marked.

Subsequently an improved formula was developed, which basically is an extension of the above principle:

Number of paces to be taken to mark one tree = $\dfrac{\text{constant}}{\text{No. of rows being selected from} \times \text{distance between rows}}$

The constant is determined by the number of paces to the chain taken by the marker:

No. of paces per chain	Constant
22	145.2
23	151.8

No. of paces per chain	Constant
24	158.4
25	165.0
26	171.6
27	178.2

Thus to apply the previous example to this formula:

$$\frac{145.2}{4 \quad x \quad 6} = 6.05 \text{ or } 6 \text{ paces}$$

Provided the marker maintains the length of his pacing constant, the error per acre will be negligible. However, due to undergrowth, low pruning debris and occasional inconsistency in pacing, this is not always the case. Therefore periodic spot checking of ones work is necessary. A square chain picked at random was used by most markers, but although being a useful guide, it is not sufficiently reliable. Half acre lots also were tried and this proved to be a much more exact check, but of course also much more time consuming.

Therefore a method was sought which would retain the speed and flexibility of the pacing method whilst eliminating inaccuracy due to natural obstructions and human error.

The answer to this was to count all trees marked without extra loss of time or mental effort. To do this a row counter of a knitting machine was originally used (despite strong protestations by Mrs. Kesners). Subsequently tally meters were ordered and used. The tree marker carried this little instrument attached to his index finger, and as each tree was marked it was also tallied. This of course was done whilst still taking the required number of paces. A glance at his progress figures on the face of the tally meter enables the marker easily and instantaneously to check the rate of his marking at any stage - at the end of each "run", or at the half way or quarter mark, and adjust it if necessary. After completion of each "block" (i.e. an area between two extraction tracks), the total number of trees marked was read off the counter and checked against a previously prepared table, which, in the case below, applies to a 6 ft. spacing between rows:

No. of	Length of Block in Chains			
Rows.	10	11	12	13
1	10	11	12	13
2	20	22	24	26
3	30	33	36	39
4	40	44	48	52
5	50	55	60	65
6	60	66	72	78
7	70	77	84	91
8	80	88	96	104
9	90	99	108	117
10	100	110	120	130
11	110	121	132	143
12	120	132	144	156
13	130	143	156	169
14	140	154	168	182
15	150	165	180	195

This particular table is based on 100 trees to a block 10 chains long x 10 rows (=60 ft.), an allowance of 6 ft. (or one row) being made for the extraction track. It can easily be, and has been, extended to cover different spacings and lengths of blocks.

The only extra time this method takes is checking the lengths of blocks before marking. This can be done from 10 scale plans, air photos or by pacing. Since practically in all cases this distance is the same for at least half a compartment, but in most cases for a series of half compartments, the time required to do this is negligible compared to the time gained in not having to maintain periodic spot checks. Besides, the marker is always certain of the exact number of trees he marks in each compartment.

A further application of the tally meter was in checking areas of old marking where the number of trees marked was below 100 and had to be brought up to 100 trees per acre at the same time as the second 100 trees for final thinning were marked. Conversely, it was also used in compartments where old marking exceeded 100 per acre which had to be reduced accordingly.

With increased emphasis on piecework and contract high pruning, this method is proving itself also as a useful time saver in checking contractors payment figures. As the marker completes each compartment, he records the number of trees marked on his 10 scale progress plan as well as a relevant record book. This is later compared against the contractors' payment claims over the respective area high pruned, thus saving physical checks.

In conclusion, a comment regarding the consequence of this work. Marking for high pruning is one of the most important jobs of a plantation officer. The trees he selects will be carried through for the full rotation of the stand. The term "marking for high pruning" has become standard nomenclature, usually associated with a repetative job allocated to a junior officer and regarded as monotonous and not always pleasant. Perhaps, in order to emphasise the importance of this work we should change this term to "selection of final crop trees" and use it habitually.

Agreed.