

3. That the Lands Department should procure the seed at an earlier date than hitherto, and not keep back the order until such time as the annual amount for afforestation is voted by Parliament.

4. That in the event of failure to obtain the amount of seed required, it is better not to sow at all than to sow substitutes of a less valuable character.

#### 5. *Regarding Thinning of the Plantations.*

In modern forestry practice it is the invariable custom to plant the trees much closer together than they will be allowed to remain for the final crop. This close planting allows a canopy to be rapidly formed, so that the lateral branches, owing to lack of sufficient light, are suppressed and the trees develop straight trunks without branches. After a certain number of years, which differ for different trees, a considerable number of the trees are removed. This process is known as "thinning," and it is repeated at certain intervals.

This question of thinning is perhaps the most difficult and important problem that confronts the management of the State plantations at the present time. Were there a market for the early thinnings, as in Europe, where nearly all the refuse of the plantations can be used, then thinning could be practised without question, but here there is no sale for the large amount of immature timber that would be for disposal. We think, then, that though without doubt thinning has a most beneficial effect on those trees that remain, it is doubtful whether in New Zealand it is a payable proposition, and we are not sure that it might not be better not to thin at all and so allow the law of the survival of the fittest to operate. Which is the more payable plan time and experiment will alone show.

Regarding the plantations of the future, there is no doubt that as population increases there will be a market for all our thinnings, and that the ultimate value of the crop will be increased.

#### 6. *Sowing in situ.*

The method of raising trees by sowing directly where the plantation is to stand is one well recognized in European practice. Thus Schlich devotes twenty-five pages to the subject,\* detailing various methods. In New Zealand, too, many plantations of Australian gums have been raised from seed. But in the Government plantations, except for a few oaks and chestnuts, nothing of moment has been attempted. With regard to sowing *in situ*, certain early experiments were carried out by Mr. H. Matthews, but under very adverse circumstances, and it may have been their failure that led to sowing *in situ* being considered a valueless method. Mr. Goudie, too, more recently has conducted a few experiments which also ended in failure. The following observations have combined to convince us that every effort should be made to find out some cheap and effective method of raising plantations direct from seed. At Waitati, near Dunedin, some standing tea-tree scrub was burned a number of years ago. Growing in close proximity was an old tree of *Eucalyptus numerosa*, which bore an abundance of seed. This latter, blown by the wind, found a congenial seed-bed in the ashes left by the fire, and the young plants came up by hundreds, and, growing faster even than the aggressive tea-tree, rapidly formed a close thicket of gums, which now is a small wood (see photos Nos. 2 and 3). Survival of the fittest has gone on so that at the present time there are numerous young trees with trunks varying from 28 in. to 29 in. in diameter growing at suitable distances, and the smaller saplings, &c., are rapidly being suppressed. If gum-plantations can be raised in this manner, not only is an extremely cheap method of raising gums *in situ* available, but also a great deal of worthless land might be readily and rapidly

\* "Manual of Forestry," vol. 2, pp. 151-76.