

(4) The comparative results from natural regeneration and artificial regeneration (planting).

With these objects in view, the New Brunswick Forest Service surveyed the plot, dividing it partially into strips, one, two or three chains wide, and partially into 1-acre circles, which are being managed under different methods.

The Bathurst Lumber Company logged some 300 acres of the plot during the winter of 1919-20. The remainder of the plot has already been cut this season.

The reference map accompanying this article illustrates the method of subdivision. Each alternate strip was two chains wide. These, in rotation, were cut to 10-inch, 8-inch and 6-inch diameter limit. The slash was alternately lopped and left as it fell.

The other alternate strips were cut clear of conifers, and in pairs were one, two or three chains wide, *i.e.*, two strips were 1-chain wide, next two 2-chains wide, etc. The slash on the clear cut strips was alternately burned and left as it fell.

At the south end of the plot, eighteen 1-acre circles were cut clear. The slash half of the number was burned, on the others either lopped or left.

This arrangement of strips affords an opportunity for a comparative study of the progress of regeneration on areas thinned to 10-inch, 8-inch or 6-inch diameter; and with slash lopped or left; and on clear cut strips of several widths with slash burned or left as it fell. The varying width of the strips will also provide data as to the distance to which seeding from the side can be secured.

The question of wind-firmness may be studied relatively when the windbreak strips are variously thinned with clear-cut strips of different widths intervening.

During the past summer it was deemed advisable to alter the arrangement of the strips somewhat, and accordingly the remaining 200 acres of the plot were surveyed into strips 3 chains wide. The odd numbered strips, *i.e.* Nos. 1, 3, 5, etc., were clear-cut, the others, 2, 4, 6, etc., were cut to a 12-inch diameter limit. Over the entire season's cut, with the ex-

ception of some 25 acres on which the slash was piled for burning, the tops were lopped.

This change of regulations considerably increased the range of experimental possibilities. The 12-inch diameter limit is added, and the 3-chain wide wind-break strips do not appear in the original arrangement.

To "mark" the trees for cutting to the proper diameter limit, the regulation governing each strip was written at frequent intervals along the blazed strip line, and a pair of calipers was supplied to each gang.

The principal object of disposing of slash by the various methods on this experimental tract is threefold, namely, to determine the relative values (1) in aiding reproduction, (2) in controlling insect hazard, and (3) in reducing fire hazard.

Behind each logging gang, a crew of two or three "brushers" followed as a separate unit rather than as a part of the gang.

Piling the brush, if fairly dry, in numerous small piles before firing any, then burning a number of piles simultaneously was found to be the most satisfactory method. But when wet or snow-covered tops were to be disposed of, a coal bed from dry wood was first necessary. On such a bed the large percentage of water that can be disposed of with the slash is remarkable.

To compare rate of growth in the past with prospective rate of growth, complete measurements showing stump height, log lengths and top lengths, diameter at each section and at breast height, age counts at each section with the radial growth in 10-year periods, in other words, stem analyses, were taken of all conifers on one tenth-acre plot on each diameter limit strip. From sixteen of these plots, 670 trees and perhaps as many saplings were recorded.

The experiment will afford an opportunity to compare planted seedlings with those of natural regeneration. Therefore, 5,000 plants 3-years-old stock, of Norway spruce of fair viability were set out in May last. These were distributed