

young and vigorous growing trees produce the best fertile seed and the most seed. Spruce trees reach the above stage at about fifty years and more of active growth. A healthy tree should reach 7" or more diameter breast high at that age, and a height of forty-five feet and over. A seed tree should be sound and have a very full crown; incidentally this type of tree is one of the least susceptible to being blown down by storm.

Considering that trees can cast such great distances, the leaving of seed trees a fair distance apart would ensure a plentiful supply of seed.

Cut the Balsam Clean

I propose that considering the tendency of the balsam to crowd out the spruce also its great facility in reproducing itself, and its susceptibility to rot and insect pest, it should be cut clean in this region. Even then the amount of seed in the ground and the number of seedlings already established will give the balsam the upper hand in most stands, that is to say the balsam is to be treated as a sort of weed and all attention given to encourage the valuable spruce.

The general procedure to be adopted will be the marking out of the spruce seed trees

over the proposed cut. The size of each cut area would depend entirely on its exposure. Well protected locations could be cut all at once. Wherever there was any danger of wind falls one could do the cutting at two different periods, say ten years apart, the first cut to be carried out along narrow belts irregular in figure and direction (due to topography and disposition of the timber) which would not give sufficient play-room to the wind. The whole section could be gone over the first time to remove all damaged and diseased trees, that is the decrepit and dying trees which would not survive ten years.

Particular pains would also be taken during cutting operations to make use of all merchantable fallen timber, so as to clean up the ground and decrease the chance of forest fires. The trees remaining after the cut, being healthy, would profit by the increased light; that is, they would produce more and better seed (besides laying on growth to themselves). A few years after the cutting, the young growth would be well established and one could remove, if one wished to, both the seed trees and the trees left as wind breaks.

Proposed Method of Operating and Regenerating the Jack-Pine Type of Forest

The Jack-Pine invariably comes up on burnt land, and it is doubtful if any other phenomena could bring about a successful regeneration. It is one of, if not the most rapid grower, and assures a supply of good pulpwood. The young stands are patchy and in places are so dense that one can hardly make way through them while all over one finds very thinly wooded spots occurring.

As the Jack-pine comes up after burning, it is necessarily even aged stands. The method of exploitation heretofore pertaining has been to remove trees over a certain diameter and this practice has in reality caused the removal of the fine trees while leaving the poor and smaller trees which, as a rule, have been growing in the denser stands and hence have been well supported on all sides, these are now bent down and broken by the wind, snow, sleet, etc. The loss due to the above cause is considerable.

I am of the opinion that the following outlined treatment will benefit the forest, by stopping the enormous waste due to the

present method of cutting and at the same time it will greatly increase the natural wood growth. I am further of the opinion that in all dense groups of younger stands, that is, forty years and under, that a thinning should be carried out by means of a first or preliminary cut, which will remove the suppressed or choked trees and leave about 50% of the original stand. In the stands of over forty years, a general thinning should be done taking the fully matured as well as the suppressed or choked trees, thus leaving well set trees with good crowns to grow until the final cut takes place, in, say ten to thirty years.

Eventually the question of regeneration of these stands after the final cut will have to be dealt with, and it is more than possible that this will require to be accomplished by applying light and controlled burning to the areas, as certain soil conditions necessary for the germination of seed will be brought about by the action of fire, and the formation of ashes on the ground.