WORK OF THE UNIVERSITY OF MINNESOTA AT THE CLOQUET EXPERIMENTAL FOREST

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Ever since I worked on the yellow pine provenance experiment on Benton Flat at the Priest River Station I have been interested in that phase of forestry. When I came to Cloquet, little was being done in that field, possibly because such studies are costly and results are slow in coming. True, we were doing a little with various exotic species of Populus, but there the general idea was to find something of value for windbreak planting. As I traveled through the north country on a now probably forgotten survey of cut-over lands more than 25 years ago, I was impressed by the great variation in the form and development of jack pine. It seemed to me that there must have developed strains or races of this species down through the years. Today, I am not so sure that what I saw were strains or races.

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In 1939, I succeeded in getting hold of some Bankhead-Jones funds for a study in provenance of jack pine. With the help of various forestry agencies in the United States and Canada, we collected seed from 38 locations. We planned to test not only the influence of provenance, but also the effects of the character of the parent trees. Thus in some places the seed was collected from 10 individuals of good form and 10 individuals of poor form, in some cases from good stands and from poor stands, and in some cases from trees with non-serotinous cones in a region where serotinous cones were normal. Collections ranged from as far south as Eau Claire, Wisconsin, and Peterson, Minnesota, north to Athabaska and Lesser Slave River and from the coast of Maine in the east to Saskatchewan in the west. Seed was extracted by hand after opening the cones in an electric oven at 130° F. Germination tests were made and the size of seed determined. The stock was sown in the forest nursery and planted in plots of 25 trees in a cleared area. The exact location for each selection was determined randomly. A spacing of five feet was used. As far as possible, all plots were made in triplicate.

Survival counts were made annually, and for a number of years height growth, form, and the presence of insects were recorded. It soon became apparent that insects were having a tremendous influence on the form of the trees. The shoot borer (Eucosma sonomana) and the pitch nodule maker (Petrova albicapitana) were the worst offenders since they often destroyed the leader and eventually the tree became an "apple tree" jack pine, regardless of the source. As I watched these trees develop, I could not help but wonder if many of our poorly formed jack pine were not the result of these outside influences rather than site. Possibly all our good virgin stands were the result of coincidence, originating while there was a minimum of insect epidemics, a minimum of fire, a minimum of rabbits, and a minimum of diseases.

There is not much to choose from between sources so far as survival is concerned. The lowest survival is 83 percent in the Wellston, Michigan source as compared to 100 percent in many sources. Annual height growth varied from 0.24 feet in the Eau Claire selection to 1.07 feet for the New Jersey selection. The New Jersey selection was a plantation from seed presumably from Minnesota. In general, the far northern selections have shown the slowest growth rate.

During the winter of 1947-48 we had severe winter injury. Many native species and natural stands in the woods showed severe "browning." Most severely affected were the selections from the Southern Peninsula, of Michigan, in which 93 percent of the trees were injured.

Because of the insect damage, it has been impossible to arrive at any reliable conclusion as to the effect of the parent on the form of the tree. Possibly as the trees grow they will pass the zone of insect damage and develop into more typical trees.

The significant and valuable information to be had from this study is yet to come.