

Man Made Aspen Forest

Various individual trees of the genus *Populus* with superior growth, physical and pulping traits have been identified in Wisconsin, Michigan, Minnesota and at least one European country. Careful measurements of the trees and evaluations of the sites where they are growing are recorded by I.P.C. From cores extracted from the superior trees, laboratory technicians have determined the fibre length specific gravity, pulping characteristics and other facts about the wood. They have also made hand sheets from the cores from which they have determined the quality of paper board that can be expected from full scale pulping.

Branch samples with flower buds are collected from the candidate superior trees. The branches are collected by shooting them down with a rifle. The branches are then placed in a green-house and the buds are forced to flower. Geneticists are able to assess the genetic characteristics of the superior trees. Many are found to have more than the normal number of chromosomes such as twice the normal number (diploids), three times the normal number (triploids) etc.

The flowers are cross-pollinated in the laboratory. The seeds thus produced are planted in a nursery at the Institute. Although aspen is very difficult to germinate and grow, the people at Appleton have produced

seedlings in sufficient quantities to establish several outplantings such as the two plantations we have established.

We established our first plantation in the spring of 1970 on land well suited to agriculture. The soil is sandy loam, one of the best soil types in this area, and the water table is about seven feet below the surface. The land was plowed and disked in the manner used prior to the planting of agricultural crops. The trees were planted by hand on a ten foot by ten foot spacing lined up in both directions.

Competing vegetation was controlled throughout the 1970 growing season by mechanical means. A farm tractor with corn cultivators was used in two directions.

The second hybrid aspen plantation was established in the spring of 1971 also on very high quality soil. The soil type is loam, the best type in this part of Michigan and the water table is about 6 feet. The site was plowed and disked then dragged to reduce the soil particles to fine consistency.

This plantation was put in with a tree planting machine. As in the first planting, the trees were one year-old seedlings with a minimum stem caliper of about 1/4 inch and a minimum height of about eight inches. In most cases, the seedlings were taller than the eight inches and had been cut back to eight inches to one foot in the nursery. The root formation on all plants was good and

many healthy buds were present on the stems.

The field was marked off prior to planting on 10 foot by 10 foot intervals in both directions. The man riding the planting machine was able to line up the trees in both directions to facilitate later cultivation.

The first plantation was cultivated throughout the first growing season and twice during the early part of the second growing season. The second (1971) plantation was also cultivated throughout the first growing season and has been kept free of weed and grass competition this year also.

We have not established permanent growth study plots in either aspen plantation but we have made gross comparisons between the various hybrids present and general evaluations of the growth and form of the trees.

The survival was uniformly good in all hybrids on both sites despite less than normal rainfall during both 1970 and 1971. The best growth and form exhibited to date is by crosses between *populus canescens* and *P. grandidentata*.

The dominant trees in the 1970 planting are about 15 feet tall and most are showing signs of developing a single major stem. The largest trees in the 1971 plantation are ten to twelve feet tall and also have good form.

We don't foresee aspen plantations as a major source of our raw

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material due to the cost of establishing and maintaining them and the supply of natural aspen available. Still, competition for forest land and other factors may make plantation aspen more attractive in the future.

The optimum management practice

for plantation aspen will probably be to harvest the original planting as soon as it reaches merchantable size and then harvest the resultant successive sucker stands as they reach merchantable size.

The limiting factor in optimizing

the potential of hybrid aspen plantation seems to be the size and age of the stems that can be pulped in a given mill's process. Obviously, if one, two or three-year-old material could be utilized, aspen plantations would have a very exciting potential as a source of raw material.