

Tree Improvement in Relation to the Hardwood Veneer Industry

by

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In 1853 the New England naturalist and inhabiter of wild places, Henry David Thoreau, jotted in his journal: "If a man walks in the woods for love of them for half his days, he is esteemed a loafer; but if he spends his whole day as a speculator, shearing off those woods, he is esteemed industrious and enterprising--making earth bald before its time".

The decimation of forests was well under way in classical times, for Homer described the noise of battle as "the din of woodcutters in the glades of a mountain".

Man has been singing romantic hymns about the forest since antiquity; he has also regarded it as something hostile, to be cleared and burned.

Our first settlers found trees overabundant and free for the taking and covering land needed for crops: so, the trees were best cleared away. You know the story of how lumbermen cut the timber in the East and then moved into the Lake States, there splitting up, some going South and others West.

Gifford Pinchot and Theodore Roosevelt brought conservation to the United States, and now, today, we have a new breed of lumberman. He carries a forestry textbook as well as an axe; he is using the tools of modern science. Instead of "cutting out and getting out" he is tending trees that his grandchildren will see in their prime. He manages the land to restore wildlife, to maintain the water holding capacity of the soil, and to provide green belts for campers and hunters. You who are part of this new breed of men in the woods are bringing scientific techniques to bear on every phase of forest life. Bert Thomas, President of the Battelle Institute (Columbus, Ohio) says, "Twenty-five years ago research was what a university professor did in his spare time. Today it is the heart and soul of the progress of civilization".

Speaking as a representative of the wood using industry, we are happy and fortunate to be working with you on some of your projects.

Forest management can do much to restore the past imbalance between logging and tree growth in American forests. However, there is another disturbing factor in the long range picture. Recent industrial estimates warn that the United States' demand for timber may double within the next 50 years. There are two ways to meet the problem. First, the tree itself can be better utilized. In 1900 only one-third of a tree found its way into useful products. Today nearly three-quarters of a tree is fully utilized.

Industry has done an outstanding job of development in the processing of wood in the form provided by nature, but we sometimes forget that quality control starts in the woods--not in our plants. We are dealing not with a mineral that is mined, but with organic fibers produced in living trees, that, like all agricultural crops, can be modified and improved in both yield and quality through culture, selection, and breeding.

We talk frequently about the tremendous improvements that have been made in the agricultural field. Take corn for example. When I was a boy, a corn yield of 35 bushels per acre was normal, in a good year 55 bushels was produced. With the corn of today we have a yield of 80 to 100 bushels. Approximately 90% of the corn acreage in the United States today is planted to hybrid corn. American farmers are producing more corn today on 82 million acres than was produced on 103 million acres only a generation ago.

By selecting superior trees and taking notes of the conditions under which they are growing, harvesting their seed crops, and planting and observing their offspring, you can improve the quality and increase the production of our hardwood species here in the Middle West.

SPECIFIC INDUSTRY DESIRES

Industry, with your help, would first of all like to have strains of black walnut (Juglans nigra L.), white oak (Quercus alba L.), sugar maple (Acer saccharum Marsh.), black cherry (Prunus serotina Ehrh.), and the other popular cabinet woods that under the same site conditions and good management could exhibit increased growth rate in diameter and height, while still keeping the desirable characteristics of the wood. I personally feel that faster grown second-growth timber would be worth more than slow grown second-growth timber of the same size, the latter not having as much "character"(a handicap being the higher percentage of sapwood).

Secondly, the form of the tree is very important to industry. It should be straight and produce logs of small taper and without blemishes. While diameter is important to us, it is not as critical a point as it once was thought to be, for we find large over-ripe trees more subject to woods damage than medium- sized vigorously growing trees. Please do not misunderstand me. We, as an industry, would like to harvest only large mature trees, but in order to supply the demand in this country we have been forced to take logs of smaller diameter. In some cases they may be younger trees or perhaps old trees that have grown more slowly due to poorer soil. In the early days, industry liked walnut, oak, cherry and maple to be 24 inches and up in diameter. The trend over the :years has, in the case of walnut been to go down to 18 inches as a minimum, then to 16 inches and up; today it is 15 inches and up. Oak has stayed at the larger sizes because the method of slicing requires the larger logs. Today oak 20 inches and up is used. The cherry and maple specifications have been lowered too, and now we are using these two species down to 15 inches as a minimum diameter. Industry thus far has been able to meet its quality standards with the smaller logs. The limit has been reached, however. It seems reasonable to believe that in the case of walnut, cherry, and maple the production of the larger sized trees on a 100 to 150 year rotation could be relaxed and more concentration placed on producing a medium sized tree on a shorter rotation.

The branching habits of the superior trees selected should be studied. Face veneer and lumber producers both look for logs that will run clear for at least 10 to 16 feet. An important portion of our market demands a clean, clear sheet of face veneer 8 feet-6 inches long to be used for 4'x8' plywood panels. It is still

necessary that we aim for hardwood veneer and lumber that will produce the highest possible percentage of knot free cuttings.

The selected superior seedlings and trees should have adaptability to the site on which they will be planted.

The selected trees should be resistant to pests since the marks pests leave down-grade veneer and lumber in appearance. Mineral streaks also fall into this appearance category.

The superior trees just described should, under proper management, yield high quality products. However, I imagine there are too many factors involved to justify acceptance of such a philosophy. You know and understand wood quality much better than I. There is wood density, specific gravity, the ratio of summerwood to springwood, non-uniform growth, tension wood, compression failure, and more to consider.

In cabinet hardwoods used chiefly for furniture, paneling, doors, and interior trim, the emphasis should be first on appearance, followed by machining and finishing properties and dimensional stability. We probably can not breed out all problems such as shrinkage, checking, warping, or twisting during fast drying. It is well recognized that no wood structure would do all this, but perhaps we can control them to become a minimal problem.

A careful screening of all traits that may be of commercial significance should be made and at least in the beginning only one or two should be singled out for study during the propagation of superior trees.

There has been past discussion on selecting and breeding for distinctive figure in fine hardwoods, including bird's-eye, fiddleback and possibly even for the deformities (that is, crotches, burls, and figured butts) which have produced valuable fancy veneer and lumber. The cost in extra handling due to the smallness of the individual blocks makes it uneconomical to process these fancy pieces and place them in the hands of the consumer at a price he would be willing to pay. When industry asks our modern designers to bring forth something new, they are told it must be designed so that it can flow through the plant with a minimum of individual operations. Thus, our designers are geared to the conveyor belt and bring forth products that lend themselves to this method of fabrication. With this in mind, the veneer and lumber industry is looking for the long clean sections of the log which are easiest to convert into the final product.

Of course, industry, to stay alive, must adapt itself to the times. The properties that sell fine hardwoods are often not their physical and mechanical properties (those stressed and studied in the laboratory), but the characteristics that make them most appealing aesthetically at the particular time (that is, for a decade or so) at which they are being marketed. Very few of us understand this. The popularity cycles among the woods are usually strongly influenced by design and interior decoration preferences of a period. Examples are the popularity of dark mahogany during the Victorian period, of maple, cherry, and walnut during the early American period, of Rift oak during a decade not too long past, and of walnut on today's market due to the new finishes that tone the beauty spots of nature into a pleasing-looking product.

Many of us upon learning the high prices brought by figured woods--take figured Claro walnut, for example--have asked why they should not stress the propagation and growth of such timber. However, it was not more than 10 to 15 years ago (after the 1925 - 35 period and until the early '40's) that such figured wood was scarcely salable because streamlined (plain) and quartered walnut, and later comb-grained oak, were most wanted and brought the highest prices. I do not condemn trying for certain unusual characteristics in wood. For example, a number of years ago, a highly figured black walnut tree, known as Lamb's walnut, was propagated by grafting and there was some effort made to establish this strain in commercial quantities. It may some day be popular, if it can be obtained in large enough quantities and at competitive or reasonable prices.

CONCLUSION

In many respects, the matter of wood quality is intangible and hard to pinpoint. But wood has stood the test of time; the consumer wants our product. Designs come and go; species come and go. For the past few years, industry has tried to promote the lesser known hardwood species because of their availability at a much lower price. However, the most popular species still are the ones I named earlier--that is, walnut, oak, maple, and cherry. These woods are still in the forefront. From one period to another, one of these species is always ascending the heights of consumer acceptance.

Therefore in summary, industry's primary objective in hardwood tree improvement, I believe, would be to increase the growth rate of black walnut, white oak, sugar maple, and black cherry. Certainly it seems to be one of the first goals that will pay off for all of us. Here is a field where genetics, forest management, and economic analysis can all work toward a common goal.